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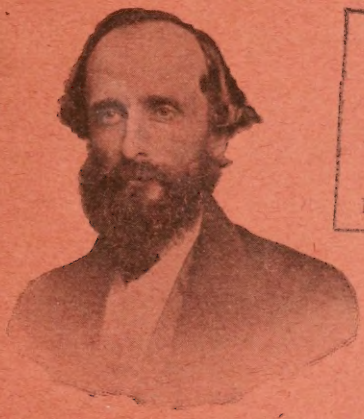
ENTOMOLOGICAL NEWS

Vol. XXVIII. No. 10.



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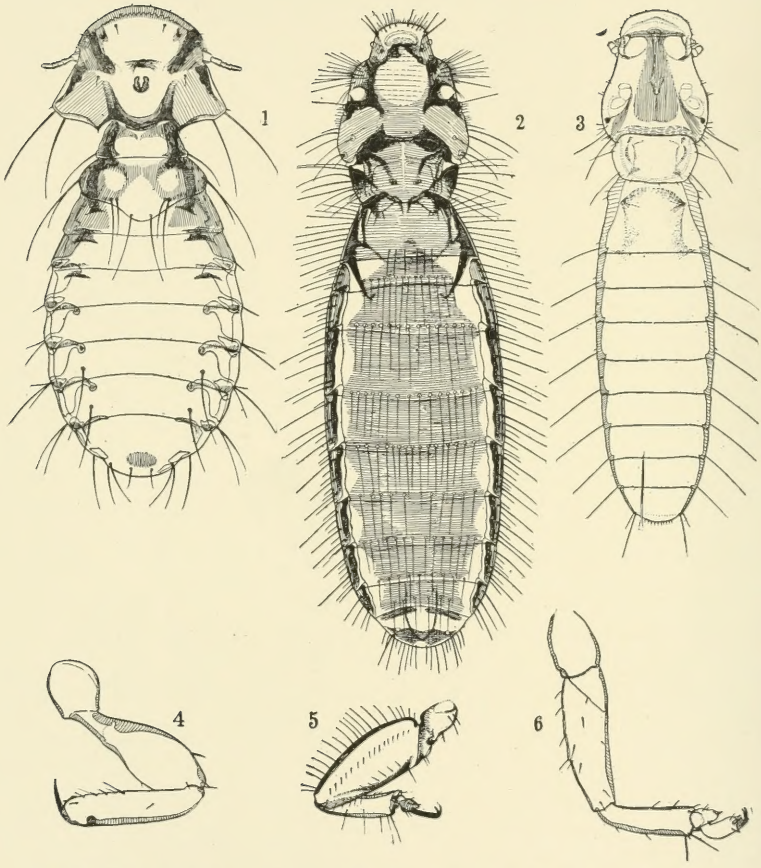

NEW MALLOPHAGA FROM NORTH AMERICAN BIRDS.—McGREGOR.

1, 4, *Goniodes zenaidurae.* 2, 5, *Laemobothrium intermedium.*
3, 6, *Physostomum melospizae.*

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXVIII. DECEMBER, 1917. NO. 10.

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Three new Mallophaga from North American Birds.

By E. A. McGREGOR, Bureau of Entomology, United States Department of Agriculture.

(Plate XXVIII.)

Goniodes zenaidurae n. sp. (Pl. XXVIII, figs. 1, 4.)

Three females (Bishopp No. 5258) from a mourning dove, *Zenaidura macroura* (L.), Aberdeen, South Dakota, June 3, 1915, W. E. Dove, Coll.

Type No. 21606, United States National Museum.

This species is nearest *G. damicornis* N. from which it differs in the occipital outline, shape of prothorax, character of lateral abdominal plates, and the arrangement of hairs and spines.

♀. Total length 1.80 mm.; length of head .468 mm.; length of prothorax .108 mm.; length of metathorax .252 mm.; length of abdomen .972 mm.; width of head across temples .666 mm.; width of prothorax .360 mm.; width of metathorax .504 mm.; width of abdomen .765 mm.

Head about two-fifths again as broad as long; front regularly convex, with eight short prickles; antennae in a narrow, shallow emargination with second joint longest; eye not noticeable, without a prickle; from the antennal sinuses the temporal margins diverge considerably and then converge most abruptly forming prominent angles at which are located a short prickle and a long hair; between the angle and the occiput another long hair, and a prickle at the inner end of posterior temporal border; the occipital border is strongly emarginate immediately before the lateral margins of the prothorax with a resulting strong convexity between these. Head color pale; with darker, broad marginal frontal bands, produced posteriorly on each side as a much darker bar, which terminate opposite the hind borders of antennal sinuses; temporal bands interrupted across the bases of antennae but extending from the dark ocular blotches, increasingly fainter, to the temporal angles; mandibles and oesophageal sclerite amber-colored; a rather narrow, brown band along the concave and convex portions of the occipital margin; broad, conspicuous occipital bands extend nearly to the antennal bands.

Prothorax trapezoidal, with lateral margins converging somewhat anteriorly, and posterior margin nearly straight; the latero-posterior angles are narrowly truncate, and each bears a strong hair; broad, dark lateral borders. Metathorax in outline resembling an acorn cup, with posterior-lateral regions rounded, and each bearing a long and a shorter hair; posterior margin produced on abdomen as a prominently rounded lobe, and bearing a group of six strong spines; an amber-colored yoke-like blotch involves the entire segment, and a broad curving band extends along each side into the first abdominal segment. Legs very pale, with somewhat darker marginal borders.

Abdomen elliptical, widest on fourth and fifth segments; middle region of abdomen uncolored; faint lateral bands and trigger-shaped, faint lateral blotches on segments three to six, inclusive, which encroach slightly onto the segments ahead; segments two to six, inclusive, also with a tad-pole-shaped blotch at each lateral posterior angle; segment one bare of hairs; segments two and three with a prickle at each angle; segment four with two shortish hairs at angles; segment five with two spines and a long hair at each angle, and a strong hair on each side nearly half way to the middle; segment six with two strong hairs at the angles, and a strong hair on each side nearly half way to the middle; segment seven with about eight hairs along the rounded posterior margin.

Laemobothrium intermedium n. sp. (Pl. XXVIII, figs. 2, 5.)

A male and two immature specimens (McGregor No. 82, or No. 271 of the Washburn Minnesota collection) from sparrow hawk, *Falco sparverius*, and a single male (Bishopp No.

3072) from the same host, Uvalde, Texas, March 8, 1914, coll. D. C. Parman.

Type No. 21607, United States National Museum.

This species is probably referable to *Laemobothrium* on account of the presence of the prominent swellings before the eyes, the absence of motile muscular lobes on the under side of forehead, and owing to the body length exceeding 5 millimeters. On the other hand, the shape of abdomen, outline of front of head, almost entire absence of ocular emargination, and the general markings, are much more suggestive of *Physostomum,* and our species may well be the link that obliterates the present separation into the two genera. Perhaps nearest *L. laticolle* N. from *Falco subbuteo.*

♂. Total length 6.03 mm.; length of head 1.140 mm.; length of prothorax .585 mm.; length of metathorax .517 mm.; width of abdomen 3.735 mm.; width of head across temples 1.260 mm.; width of prothorax 1.057 mm.; width of metathorax 1.35 mm.; width of abdomen 1.710 mm.

Head slightly wider than long; ground color pale amber; ocular emargination almost lacking, head suddenly and greatly contracted abreast of the mandible bases, sides of forehead converging to the evenly rounded convex front; temples at first diverging slightly, and then converging to the sharply rounded occipital corners; occipital margin deeply concave with a slight median convexity; antennae concealed in fossae; labial palpi barely projecting; mandibles pale with teeth blackish; antennal fossae rimmed medially and posteriorly with heavy black borders extending inward and backward to form Y-shaped blotches; a black, cleft blotch on each side at inner angle of forehead contraction; occipital border margined with blackish brown bands which give off short rudiments of occipital bands; in front of mandibles a crescent-shaped fossa, convex anteriorly; two strong spines arise at each frontal angle between which occur about 30 hairs and prickles of various lengths, a score or more of long and short hairs arise on the lateral prominences, two weak hairs at the front of each antennal fossa, a long hair arising just over the emarginate eye, several short hairs along the anterior half of temples, a long and a short pustulated hair at the temporal angles, a long pustulated hair at the base of the temporal lobe, and three or four longish hairs along the temporal margins.

Prothorax roughly quadrangular, a sharp constriction at each anterior angle forms a sort of neck-like extension which fits into the occipital concavity; the posterior halves of the lateral margins converge quickly and end in the posterior-lateral lobes which are

formed by the deep emargination of the posterior border; two long hairs arise from the angle just behind the frontal constriction; two black blotches on the front margin, a black fleck bordering the constriction inwardly, a large black blotch just behind constriction extending to center of lateral border and is continued fainter backward and inward, a narrow, curving, underlying bar extends backward and inward from a point before the anterior lateral flecks; a pair of black anterior metathoracic blotches show plainly through the hyaline posterior-lateral lobes, and from the inner points of these, fainter bars run inward and backward, finally paralleling the median line; six long hairs occur along the anterior portions of the lateral margins and four shorter ones from the posterior lobes; a peculiar H-shaped plate involves the entire segment through the cross-bar of which a faint clear stripe intersects. Metathorax and mesothorax, which are indistinguishably fused, are continuous with the abdomen; two short spines at each anterior angle, twelve long hairs along the margin of the segment and a central transverse series of six shortish hairs; margined laterally by a dark brown border which widens greatly posteriorly; a narrow band parallels this just mediad of same; another narrow band arises inwardly on each side which runs backward and inward, and meets transversely on the first abdominal segment; from the hindmost end of the lateral border horn-like bars are projected backward onto the first and second abdominal segments. Legs concolorous with ground color and thorax, with dark marginal borders.

Abdomen narrowly elliptical, with no marginal constrictions between segments; each segment with three or four long hairs and three or four short hairs laterally; segments one to eight, inclusive, with a transverse row of long spines at the posterior margin as follows: Segment one, 14; segment two, 14; segment three, 16; segment four, 16; segment five, 10; segment six, 14; segment seven, 9; segment eight, 6; first and eighth segments the shortest; terminal segment with a marginal fringe of about 20 hairs; segment one with a median, triangular, brownish blotch whose apex invades the metathorax; remaining segments (excepting the last) each with a transverse band of same color, which are shallowly emarginate laterally, thus leaving a clear region inside the brown lateral bands which are lined within with a parallel, semi-hyaline edge.

Physostomum melospizae n. sp. (Pl. XXVIII, figs. 3, 6.)

Two females (McGregor No. 90, or No. 178 of the Washburn Minnesota collection from the song sparrow, *Melospiza melodia,* St. Anthony Park, Minnesota. Possibly nearest *P. sucinaceum* Kell. from the western flycatcher; not at all like the *Physostomum* of the golden-crowned sparrow.

Type No. 21608, United States National Museum.

♀. Total length 2.17 mm.; length of head .53 mm.; length of prothorax .20 mm.; length of metathorax .30 mm.; length of abdomen 1.15 mm.; width of head across temples .45 mm.; width of prothorax .36 mm.; width of metathorax .47 mm.; width of abdomen .50 mm.

Head a little longer than wide; front evenly rounded; and sides of forehead somewhat concave; temples converging rotundately, but produced very slightly backward with sharply rounded posterior angles; occipital margin nearly a straight line; eye with a conspicuous black fleck; palpi considerably passing the margins of head; the labral lobes quite conspicuously passing the margin of head; ground color transparent, with a large, amber-colored, urn-shaped blotch occupying center of head, at the anterior end of which occurs a straight, transverse bar of the same color; antennal fossa bordered posteriorly with a faint blotch which extends toward the occipital angles; a faint, narrow band surrounds two clear, circular areas abreast of the palpi; 12 prickles occur along the front margin, four prickles arise on each side even with the antennae; two long hairs and five short ones arise from each temporal border between the eye fleck and the occiput; a broad, pale band borders the occipital margin.

Prothorax, roughly hexagonal with rounded angles; the antero-lateral facets with a weak hair and a longer one; a long hair and a prickle at the postero-lateral angles; four prickles along the posterior border; general color of segment faint amber, with a faint, narrow band paralleling the margin, and with other faint, linear blotches. Metathorax with a slight swelling on anterior third of sides, which bear each two prickles; general color resembling that of prothorax, with a central pale bordered blotch, and pale marginal bands. Legs rather long, pale, with faint marginal bands.

Abdomen with sides very flatly convex, subparallel; a long hair on the posterior angles of segments one to seven, inclusive, and with a prickle at the angles of segments one to three, inclusive; terminal segment bluntly rounded, with four longish hairs and a fringe of ten prickles; lateral bands almost colorless.

Explanation of Plate XXVIII.

Fig. 1. Female of *Goniodes zenaidurae* n. sp.
2. Male of *Laemobothrium intermedium* n. sp.
3. Female of *Physostomum melospizae* n. sp.
4. Left leg III of female of *Goniodes zenaidurae* n. sp. (viewed ventrally).
5. Right leg III of male of *Laemobothrium intermedium* n. sp. (viewed ventrally).
6. Left leg III of female of *Physostomum melospizae* n. sp. (viewed ventrally).

All figures drawn by the author with the aid of camera lucida with little attempt at restoring symmetry.

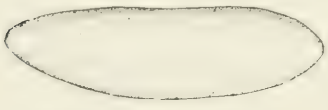
Anthocharis genutia and a new Variety (Lep.).

By Henry Skinner.

This pretty species was described by Fabricius in 1793 and the original description says, "Habitat in India Dom. Drury." A. G. Butler, in his Catalogue of Diurnal Lepidoptera described by Fabricius in the collection of the British Museum, gives the following: "Illinois, United States." The catalogue was prepared with the view of identifying the species of Diurnal Lepidoptera described by Fabricius, by a comparison with the original type specimens, drawings, etc. The presumption is that the type locality was Illinois. Until recently I have not seen any variation in this species from various parts of its geographical distribution. On March 12th of the present year Mr. W. J. Coxey caught two pairs at Savannah, Georgia, and presented them to The Academy of Natural Sciences of Philadelphia. In the males the orange tip is extended to the black spot in the primary wing and extends a little above it into discal cell. The upper side of the secondaries is washed with orange, from the border, for about one-eighth inch into the wing. The tips of the females are lightly washed with orange. It will be interesting to learn whether all the specimens found in the locality mentioned have the same markings. I propose the name **flavida** for the variety.

The Egg of Byturus unicolor Say. (Col.).

On June 7, 1917, Mr. A. B. Buchholz reported a serious outbreak of this beetle at Milton, New York. On July 3d we visited this place and found the beetles still present in considerable numbers. Some of the unripe berries were already infested with the larvae and one larva was observed just entering the fruit. On careful examination of the berries both eggs and egg-shells were found.



Egg of *Byturus unicolor* Say.

The egg is deposited on the unripe fruit and is attached by one side to one of the pistils. Only one egg was found on a berry. The egg is 1.1 mm. in length by .4 mm. in width, elongate ovoid, dull yellowish in color with the surface very finely roughened.—C. R. Crosby and M. D. Leonard, Ithaca, New York.

The Genus Harmostes Burm. (Coreidae, Heterop.).

By Edmund H. Gibson, U. S. Bureau of Entomology.

The genus *Harmostes* Burm. appears to be limited in its distribution to the New World, its species being recorded only from North, Central and South America, West Indies and the Galapagos Islands. Central America is probably its region of origin as the greatest number of species is to be found there and those occurring to the extreme north and south exhibit the greatest differences in structure. The genus now contains 16 species, 8 of which are represented in North America north of Mexico.

Harmostes is the largest and principal genus of the tribe Harmostini Stål and in general its diagnostic characters are those of Harmostini. *Aufeius* Stål and *Xenogenus* Berg, the other genera of the same tribe, may be separated from *Harmostes* as follows: *Aufeius* has the abdomen swollen or extended laterally beyond the hemelytra, and *Xenogenus* has a more elongated body and ocelli elevated. The key character for separating Harmostini from the remaining tribes of the subfamily Corizinae is the posterior femora spined beneath.

In establishing a key to the species, the use of color and color markings as diagnostic characters have been eliminated and structural differences relied upon entirely; these include principally the characters of the head and its parts, pronotal margins and angles, and size. The color within a species is quite variable, as is also the size, but the latter under certain limitations may be used.

The haplotype of the genus is *H. dorsalis* Burm., 1835, but which I now deem best to place in synonymy with *serratus* Fabr., 1794. The original description of *dorsalis* Burm. (Supra brunneus fusco-striatus, subtus flavus, pronoti margine laterali lineaque media scutelli flavis; pectore linea laterali fusca. Long. 3-3½″) is so meagre in detail that it is not possible to distinguish it from several other species. I therefore place it in synonymy with the oldest described species which falls within the genus and which has the same distribution as that stated for *dorsalis*. The coloration of *serratus*

Fabr. also fits that given for *dorsalis* Burm. The specimens which I have seen labeled "dorsalis" were determined as such by the late Mr. Otto Heidemann, but I am unable to distinguish them from *serratus*. W. L. Distant* states, "I have with Stål been unable to identify this species (*dorsalis*); it probably represents one of the preceding Mexican species; but the description is too slight for any accurate decision."

This paper is based upon specimens in the United States National Museum which had been previously determined by Messrs. P. R. Uhler, Otto Heidemann and R. M. Reuter, also upon considerable previously undetermined material, and includes one new species the type of which is in the collection of the U. S. National Museum. I am indebted to Mr. J. R. de la Torre Bueno for the privilege of examining a small collection of specimens in this genus, representing six species.

Genus **HARMOSTES** Burm.

Harmostes Burm., Handbuch der Ent., 1835.

The following is a translation by the author of the original description by Burmeister:

Resembles *Corizus* Fall., Hahn, but differing from it in having hind femora with pronounced spines. Antennae two-thirds as long as body, the first joint short, stout, and the two following delicate and of equal length, the fourth shorter than the preceding one and swollen at the apex. Ocelli near eyes. Thorax with raised curved margins, also always sloping. Front legs normal, the hind legs longer, with femora very thick, under side spiny.

A redescription of the genus is not at all necessary. Dallas gives as generic characters, besides those contained in the above description: breast furrowed longitudinally for the reception of the rostrum and rostrum reaching or passing the intermediate coxae, with its third joint as long as or longer than the fourth.

Key to the Species of Harmostes.

1. Lateral margins of pronotum crenulated.....2.
   Lateral margins of pronotum not crenulated.....8.

* Biologia Centrali-Americana, Hem. Het. Part 1, p. 168.

2. Rostrum extending beyond metasternum.....3.
Rostrum not extending beyond metasternum.....7.
3. Species large, 9-10 mm. long.....4.
Species smaller, not exceeding 8 mm. long.....5.
4. First antennal joint considerably passing apex of head, and fourth joint about twice as long as the first.....*nebulosus* Stål.
First antennal joint about reaching apex of head, and fourth joint but little longer than the first.....*formosus* Dist.
5. Second and third antennal joints equal.....*affinis* Dall.
Second antennal joint shorter than the third.....6.
6. Posterior angles of pronotum broadly rounding....*procerus* Berg.
Posterior angles of pronotum angular.....*prolixus* Stål.
7. Species small, not exceeding 5 mm. long.....*apicatus* Stål.
Species larger, exceeding 5 mm. long.....*serratus* Fabr.
8. Basal joint of antennae scarcely or slightly passing apex of head.....*fraterculus* Say.
Basal joint of antennae extending considerably beyond apex of head.....9.
9. Lateral angles of pronotum broadly rounded.....10.
Lateral angles of pronotum not broadly rounded, angular.....11.
10. Second antennal joint shorter than third.....*subrufus* Dist.
Second and third antennal joints equal.....croceus n. sp.
11. Species small, less than 7 mm. long.....*marmoratus* Spin.
Species larger, 7 mm. or more long.....12.
12. Species 9 mm. long.....*raphimerus* Spin.
Species less than 9 mm. long.....13.
13. Lateral margins of corium appearing very wide and distinctly luteous.....*bicolor* Dist.
Lateral margins of corium normal.....14.
14. Bucculae prominent, long, not disappearing before line of the eyes.....*reflexulus* Say.
Bucculae short, disappearing before line of eyes.....*minor* Spin.

Harmostes nebulosus Stål.

Harmostes nebulosus Stål, Hem. Mexicana, p. 307, Ent. Zeit, Nos. 7-9, 1862.

Head nearly twice as long as width between eyes. First joint of antennae passing apex of head and about one-half as long as fourth joint, second shorter than third, fourth not as swollen as the first. Rostrum extending beyond metasternum with darkened apex. Bucculae very prominent and rounding anteriorly and posteriorly. Lateral margins of pronotum crenulated. Pronotum coarsely and evenly punctate, median line distinct but not greatly raised. Membrane spotted with fuscous. Hind femora greatly incrassated, spined beneath with

four large prominent spines between which are three smaller ones. Size large, 9-10 mm. long. General color above light to dark brown, varying considerably within the species. Paler beneath. Lateral margins of corium spotted with fuscous.

Occurs in Mexico, Guatemala and Salvador.

Harmostes formosus Dist.

Harmostes formosus Dist., Biol. Cent.-Amer., Hem. Het., Vol. 1, p. 167, 1893.

"Head ochraceous. Antennae with the basal joint incrassate, dark ochraceous, and about reaching apex of head; second and third joints subequal in length, testaceous; apex of second joint fuscous; fourth joint short, a little longer than the first, thickened with fuscous. Pronotum ochraceous, finely punctate and obscurely wrinkled, subgranulose near anterior margin, with the lateral angles rounded and strongly reflexed; angular margins fuscous, lateral margins luteous and crenulated, anterior angles prominent; a central pale longitudinal line which is raised and levigate near anterior margin; posterior margin narrowly pale luteous. Scutellum ochraceous, with a central longitudinal line and apical margin pale luteous. Corium luteous, sparingly and finely punctate (clavus thickly so), with a large, elongated, fuscous spot on disk, a row of small fuscous spots on costal margin, and a larger spot of the same color near apical angle. Membrane pale hyaline, with obscure fuscous spots. Under side of body pale luteous, lateral margin of head and sternum strongly punctate; abdomen with a few scattered black punctures on anterior margin of disk, and stigmata black; femora luteous, with their apices, tibiae, tarsi, and rostrum testaceous. Rostrum just passing posterior coxae, with the apex pithy. Posterior femora with their apical halves strongly spined, four spines being longest, strongest, and luteous in color. Long. 9 mm., lat. pronot. ang. 3 mm."

The above is copied from the original description by Distant. This species has been recorded only from Mexico.

Harmostes affinis Dall.

Harmostes affinis Dallas, Cat. Hem. Brit. Mus., p. 522, 1852.

Head small and strongly convex in both directions. First joint of antennae passing apex of head, second and third joints about equal in length, fourth longer than the first but not greatly swollen. Rostrum extending beyond metasternum. Lateral margins of pronotum crenulate, and with a deep but gradual curve; posterior portion of thorax prominently raised and evenly punctate. Hind femora incrassated and spined beneath. Size, rather small, about one quarter of an inch long.

General color light brown but quite variable. Scutellum and apex of corium dark. Thorax and corium spotted with small red dots. Membrane spotted with fuscous. Beneath pale, with prominent red spots well scattered; abdomen more or less mottled with fuscous.

Its range includes Southern United States, Mexico, Colombia and Paraguay.

Harmostes prolixus Stål.

Harmostes prolixus Stål, Bidrag till Rio Janeiro-Traktens. Hem. Fauna, p. 37, 1858.

Head broad, first joint of antennae passing apex of head, second shorter than third, fourth one-half longer than first joint. Rostrum extending beyond metasternum. Bucculae short, ending before line of the eyes. Eyes prominent. Lateral margins of pronotum crenulated to posterior angles. Median dorsal line almost disappearing in center of thorax. Thorax, scutellum, and corium finely and evenly punctate. Hemelytra widest at the middle. Membrane hyaline with faint fuscous spots. Hind legs with femora greatly incrassated and with three large prominent spines beneath, between which are from two to four smaller ones. Size about 7 mm. long. General color above dark brown but may vary to lighter shades. Beneath lemon yellow mottled with fuscous laterally. Posterior two-thirds of hind femora dark brown to black.

This species is reported from Rio Janeiro. I have also seen specimens from Mexico, Porto Rico and Paraguay.

Harmostes procerus Berg.

Harmostes procerus Berg, Hem. Argentina 1879, p. 91.

No specimens of this species have been examined, but by the original description it can readily be placed in the key to species and should be easily recognizable. A synopsis of the original description is here given:

Head moderately long, second joint of antennae shorter than the third, beak extending beyond the metasternum. Lateral margins of pronotum strongly crenulate, posterior angle broadly rounded. Membrane subhyaline with an obsolete median fuscous line. General color yellowish, corium tinged more or less with green. Size 5-6½ mm. long.

The most pronounced character by which the species may be separated from *H. prolixus* is the broadly rounding posterior angles of the pronotum.

Berg records its occurrence at Buenos Ayres and in Patagonia.

Harmostes apicatus Stål.

Harmostes apicatus Stål, Freg. Eug. Resa. Ins. p. 238, 1859.

Head broad, first antennal joint considerably passing apex of head, second and third joints about equal in length, fourth slightly longer than first. Beak not extending beyond metathorax. Bucculae disappearing at line of the eyes. Lateral margins of pronotum prominently raised and crenulated. Thorax and corium coarsely punctate. Hind femora greatly incrassated and spined beneath. Size 5 mm. long. Color light brown to russet above, somewhat paler beneath. Membrane hyaline with faint fuscous spots.

Its distribution includes Chile, Paraguay, Brazil and Argentina.

Harmostes serratus Fabr.

Acanthia serratus Fabr. Ent. System., iv., p. 75, 1794.

Harmostes perpunctatus Dall. 1852, List Spec. Hem. Ins. Brit. Mus. Part 2.

Coreus gravidator Fabr. Ent. System., iv., p. 133, 1794.

Harmostes dorsalis Burm. Handbuch der Ent. 1835.

Head long with long lateral spinous processes between eyes and antennae. First joint of antennae stout, but slightly passing apex of head, second joint shorter than third, fourth about equal to first in length. Beak not extending beyond metasternum. Bucculae not prominent, disappearing at line of eyes. Lateral margins of thorax crenulated, posterior margin wide. Pronotum, scutellum and corium coarsely punctate. Hind femora incrassated slightly before the middle making anterior portion of femora appear long. Size 7-8 mm. long.

General color above dark brown, paler beneath. Membrane hyaline with fuscous spots. Costal margin of corium pale.

The range of this species includes Brazil, Argentina, Paraguay, Galapagos Islands, West Indies, Central America and practically the entire United States.

Harmostes fraterculus Say.

Syromastes fraterculus Say, Desc. New Spec. Het. Hem. of N. A. New Harmony, Ind., 1831, p. 324.

Harmostes fraterculus Stål, Enum. Hem. 1, 221, 1870.

Head rather short, first antennal joint scarcely or slightly passing apex of head, second and third joints about equal in length, fourth joint only slightly longer than first and strongly pubescent. Bucculae small, ending before the line of eyes. Beak extending beyond metasternum. Lateral margins of pronotum not crenulated. Median line of pronotum distinct, becoming very prominent on scutellum. Thorax

and corium coarsely punctate. Hind femora incrassated with rather short spines beneath. Size less than one-fourth of an inch. Color above a russet brown tinged more or less with rufous. Paler beneath. Membrane marked with a longitudinal obsolete brown line and small fuscous spots.

It is well distributed over the United States and south through Central America.

Harmostes subrufus Dist.

Harmostes subrufus Dist., Biol. Cent.-Amer. Hem. Het. Vol. 1, p. 167, 1893.

"Head, pronotum, and scutellum luteous, sparingly but coarsely punctate. Antennae ochraceous; basal joint incrassated and considerably passing the apex of head; second joint a little shorter than the third, fourth a little darker in color, thickened and about equal in length to the first. Pronotum with lateral angles rounded, subprominent, and slightly reflexed, a central longitudinal line and posterior margin narrowly pale luteous; two obscure fuscous fasciae near lateral margins. Scutellum with the lateral and apical margins and a central longitudinal line pale luteous. Corium testaceous, nervures and costal margins luteous. Membrane pale and hyaline. Underside of body and legs luteous; lateral margins of head and sternum strongly punctate. Long. 8 mm."

The above is a copy of the original description by Distant.

The species is known to occur in Mexico, Guatemala and southwestern United States. Four specimens in the collection of Mr. Bueno are the only ones of this species which I have examined, one of which is now deposited in the collection of the U. S. National Museum.

Harmostes croceus n. sp.

Resembles *subrufus,* but can be readily separated from it by the following characters: Second and third antennal joints equal, and lack of definite color markings or dark striations, its head, thorax, scutellum and corium being ochraceous and practically concolorous.

Basal joint of antennae extending beyond apex of head, second and third joints equal in length, fourth slightly longer than first and darker in color. Bucculae rather prominent, disappearing at line of eyes. Pronotum with lateral angles well rounded, slightly reflexed; lateral margins not crenulated. Veins of corium prominent. Posterior tibiae spinous. Rostrum not extending beyond metasternum. Breast fur-

rowed longitudinally for reception of rostrum. Antennae, head, thorax, scutellum and corium ochraceous, practically concolorous. Apex of corium slightly tinged with dark brown. Membrane hyaline. Ventral side of body light orange to yellow, concolorous. Length 7-9 mm. Sternum coarsely punctate.

Described from seven specimens from southern California. Have seen a single specimen from Oregon and one from Brewster County, Texas. Type and paratypes in collection of U. S. National Museum.

Harmostes marmoratus Spin.

Merocoris marmoratus Spin., Hist. de Chile, Gay, Vol. 7, p. 166, 1851.

Harmostes corazonus Dist., Trans. Ent. Soc. London, p. 85, 1893.

Head short, apex acute. First joint of antennae considerably passing apex of head, second and third joints short and about equal in length, fourth only slightly shorter than the third. Eyes prominent. Bucculae small. Beak not extending beyond metasternum. Lateral margins of thorax wide, entire, not crenulated. Posterior angles of thorax somewhat angular, not prominently rounded. Thorax coarsely punctate. Costal margins of corium practically parallel. Width between tips of corium greater than basal width of scutellum. Hind femora incrassated but not as pronounced as in other species. Size 5-6 mm. long.

General color above dark brown, corium except for the inner borders paler, beneath yellow, finely flaked with rufous. Membrane hyaline spotted with fuscous. Fourth antennal joint dark.

This species occurs in Chile.

Harmostes raphimerus Spin.

Merocoris raphimerus Spin., Hist. de Chile. Gay, Vol. 7, 1851.

Harmostes montivagus Dist., Trans. Ent. Soc. London, p. 85, 1893.

Head long, first antennal joint stout but considerably passing the apex of head, second shorter than the third and inflated at the base, fourth joint one-half the length of the third. Bucculae small. Beak extending to posterior margin of metasternum. Lateral margins of thorax entire, wide, and flaring. Posterior angles of thorax somewhat angular. Hemelytra widest at the middle. Hind femora not greatly incrassated, spines subprominent. Size 8-9 mm. long.

General color above yellowish brown, corium tinged with rufous posteriorly. Antennae ochraceous. Membrane hyaline, with faint fuscous spots.

This species occurs in Chile.

Harmostes bicolor Dist.

Harmostes bicolor Dist., Biol. Cent.-Amer., Hem. Het., Vol. 1, 1893.

"Head testaceous, obscurely punctate. Antennae with the basal joint considerably passing the apex of the head, and much shorter than the second joint. Pronotum testaceous, coarsely punctate; lateral margins, a central longitudinal line, and posterior margin (narrowly) pale luteous; lateral angles subprominent. Scutellum testaceous, with the lateral and apical margins pale luteous. Corium pale luteous; clavus, inner apical angles, and a series of small spots on costal margin testaceous. (In the type specimen described, the left corium has a large testaceous basal patch on lateral margin, which is followed by a subquadrate spot of the same color.) Membrane pale hyaline. Under side of body pale greenish, with a few scattered black punctures; legs ochraceous. Long. 7 mm."

The above is a copy of the original description by Distant.

Its range in the United States includes southern California, New Mexico, Colorado and Texas. It also occurs in Mexico.

Harmostes reflexulus Say.

Syromastes reflexulus Say, Desc. New Sp. Het. Hem. of N. A., New Harmony, Ind., p. 323, 1831.

Harmostes costalis H. S., Wanz. Ins., ix, p. 270, 1853.

Harmostes bruesi Bergr., Ent. News, Vol. 24, p. 267, 1913.

Harmostes virescens Dall., List Hem. Ins. Brit. Mus. Part 2, 1852.

The following is a copy of the original description by Say and is in such detail that a redescription is not necessary:

"Reddish-brown; head carinate before. Inhabits Pennsylvania. Body reddish-brown, with rather large confluent punctures; head not extending more than half the length of the basal joint of the antennae, obviously carinate between the antennae, tubercles each side of the antennae acute: antennae, first joint robust, rough, much narrowed, second joint shorter than the third: terminal joint half as long as the third: thorax lateral margin a little reflected, the edge concavely arcuated: posterior angles rounded; anterior angles prominent, acute: scutel narrowed before the tip: hemelytra, corium yellowish, rufous near the scutel; nervures very distinct; lateral edge a little reflected: membrane hyaline: beneath greenish-yellow; feet pale rufous; posterior thighs dilated; spinous beneath. Length one-fourth of an inch. The rostrum hardly reaches the posterior coxae. The last joint of the antennae is elongate-oval and much shorter than the preceding joint, as defined by Latreille in this genus."

This species is distributed over the entire United States.

Harmostes minor Spin.

Merocoris minor Spin., Hist. de Chile, Gay, Vol. 7, p. 165, 1851.
Harmostes chilensis Dall., List. Hem. Ins. Brit. Mus. Part 2, 1852.

Head short, apex acute, first antennal joint considerably passing apex of head, second and third joints about equal in length, fourth about two-thirds the length of the third. Bucculae short, disappearing before line of the eyes. Beak extending beyond metasternum. Thorax coarsely punctured, lateral margins entire, wide, and somewhat flaring, posterior angles distinctly angular. Hind femora incrassated and with strong spines beneath. Size about 7 mm. long.

General color above greenish yellow to yellowish brown. Thorax tinged with rufous, scutellum distinctly yellow. Posterior border of thorax dark. Inner margins of corium distinctly rufous. Membrane hyaline. Yellow beneath.

Distribution includes southwestern United States, Chile and Argentina.

Harmostes obliquus Say.

Syromastes obliquus Say, Desc. New Sp. Het. Hem. of N. A., New Harmony, Ind., December, 1831.

There is considerable doubt as to this species. If it rightly belongs in *Harmostes* it could be distinguished from all other species by its remarkably small size, less than three-twentieths of an inch long. I have seen no specimen labeled "obliquus" and the original description is too meagre in structural details for me to attempt to place the species where it rightly belongs. I therefore simply append this species to the list of those belonging to this genus until the matter can be cleared up. Mr. VanDuzee, in his recent check list, inserts a question mark before the species. The following is a copy of the original description by Say:

"*S. obliquus*—all above punctured: rostrum and head rather short Inhabits the U. S.

"Body pale yellowish-rufous; head obviously punctured, not extending to the tip of the first joint of the antennae; antennae, first joint robust; second hardly two-thirds as long as the third; thorax with rather large punctures; no obvious transverse impressed line; hemelytra, on the corium with large separate punctures; posterior edge very oblique and elongated; membrane immaculate, undulated by the nervures; beneath more obviously tinged with rufous; feet paler; rostrum hardly reaching the intermediate coxae. Length less than three-twentieths of an inch. It may be distinguished by the remarkable obliquity of the terminal line of the corium."

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Three new West Indian Species of the Ichneumonid Genus Eiphosoma (Hym.).

By Charles T. Brues, Bussey Institution, Harvard University.

The peculiar genus *Eiphosoma* is widely distributed in the American tropics, whence twelve species have already been described[1]. In addition to these I obtained two others in Jamaica some years ago, and Dr. W. M. Mann discovered one in the neighboring island of Hayti. These are described on the following pages. The types are in the author's collection.

Eiphosoma luteum sp. nov. (Fig. 1).

♂. Length 12 mm. Almost entirely luteous, paler on the head and lower portions of the thorax; antennæ black, the scape and pedicel light brown below, darker above; basal joints of flagellum faintly tipped with pale yellow; ocellar area, connected with a large transverse marking on the occiput, black; teeth of mandibles black; middle lobe of mesonotum with a black spot in front, shading into a brown stripe behind; lateral lobes each with a brownish stripe; second and third abdominal segments black on upper edge except at tip; following segments similarly marked with piceous; tip of abdomen fuscous, external genitalia black; hind trochanters and femora at base and tip marked with fuscous; hind tibiæ dark above and their tarsi entirely dark fuscous. Wings hyaline, with a weak, but distinct infuscated area at tip.

Head broad and thin; ocelli large, the lateral ones removed by less than their diameter from the eye, twice as far from one another as from the eye. Antennæ reaching to middle of the second abdominal segment, about 37-jointed. Face shining, sparsely punctate, almost smooth medially; clypeus strongly protuberant medially; malar space two-thirds as long as width of mandible at base.

Mesonotum sparsely punctate medially, shining, on the lateral lobes almost without punctures. Scutellum smooth and shining. Propodeum

[1] See Cockerell, Proc. U. S. Nat. Mus., Vol. 46, pp. 61-64 (1913).

subshining, microscopically rugose punctate, with a distinct but not very deep median longitudinal depression; with a complete lateral carina just below the spiracle and a transverse one before apex; basally with a less distinct carina on each side, enclosing a large area on each side of the median depression; spiracle elongate-oval; tip of propodeum extending to the basal fourth of the hind coxa. Pleurae shining; mesopleura sparsely, coarsely, punctate anteriorly and below, its oblique impression transversely striated except below; metapleura impunctate.

Abdominal petiole very little enlarged at tip and without punctures; its spiracles at the posterior third very prominent; following segments clothed with stiff black hairs; claspers rounded at apex. Tooth on hind femur acute, but not long. Wings without areolet; median and submedian cells of nearly equal length.

Type collected by the writer near Kingston, Jamaica, British West Indies. It was obtained in sweepings from the vegetation near the sea-coast in an extremely arid area at the mouth of the Hope River.

This species is easily recognized by its very pale color, punctation of thorax, and prominent petiolar spiracles. It is quite similar to the following species:

Eiphosoma jamaicense sp. nov. (Fig. 2).

♂. Length 17 mm. Head, thorax and four anterior legs light yellow; abdomen and hind legs mostly fulvous. Body marked with black as follows: teeth of mandibles, wide stripe on front above antennæ enlarging to include the ocelli and widening to include most of the upper half of the posterior surface of the head, antennæ except scape and pedicel below and faint ring at tip of first two or three flagellar joints, a broad stripe narrowed behind on each mesothoracic lobe, groove at base of scutellum, anterior margin of propodeum and a longitudinal band on its dorsal surface extending from near the base to well beyond the middle, spot on posterior coxa above, upper edge of posterior trochanter, their tibiæ except for their spurs and a broad band at the middle, and their tarsi, spot at apex of abdominal petiole above, line on upper edge of second segment except at apex and claspers. Posterior femora fulvous, with an incomplete dark band near base, a narrower one before apex and pale yellow tip. Wings hyaline, not distinctly infuscated at tip.

Ocelli in a low triangle, the posterior ones separated by about twice their own diameter, and removed by one and one-half times their diameter from the eye; face and sides of front coarsely punctate, the punctures more sparse near the middle of the face and on the

clypeus; antennæ 43-jointed; sides of face slightly convergent below; malar space slightly shorter than width of mandible at base.

Mesonotum coarsely and sparsely punctate, the punctures few and far apart on the lateral lobes; scutellum smooth. Propodeum coarsely, but indistinctly rugose-reticulate, with a transverse basal carina that touches the basal margin medially and curves backward just outside the spiracle to join a lateral carina that is continuous with a transverse subapical one; median depression well marked, almost entirely smooth; tip of propodeum extending to the basal fourth of the coxa. Pleuræ polished, mesopleura in front and below with irregular sparse punctures; oblique impression smooth.

Petiole of abdomen slightly and gradually enlarged at tip; its spiracles

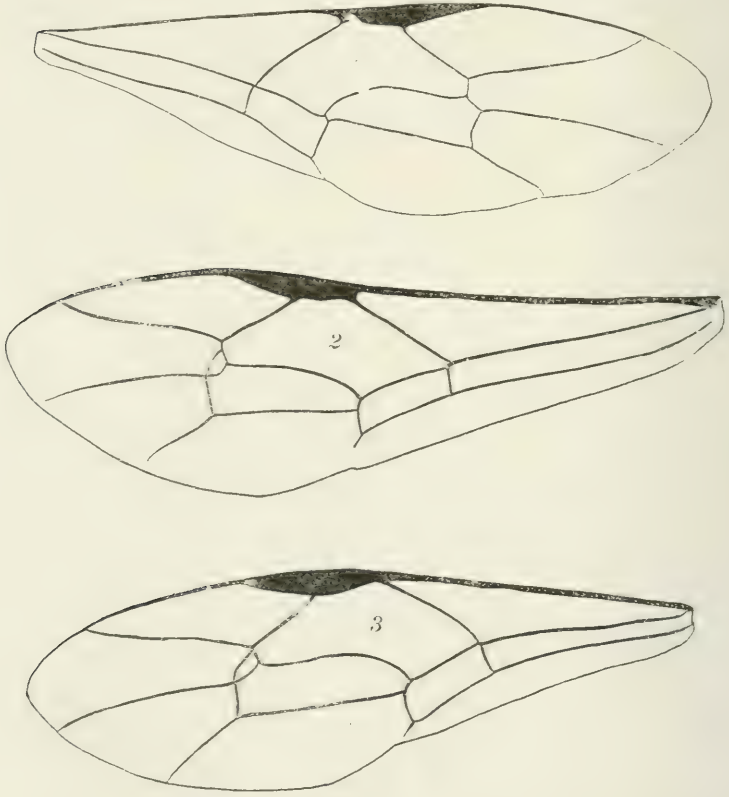

Fig. 1.—*Eiphosoma luteum* sp. nov. Fore wing of type.
Fig. 2.—*Eiphosoma jamaicense* sp. nov. Fore wing of type.
Fig. 3.—*Eiphosoma haitiense* sp. nov. Fore wing of type.

at the posterior third, not prominent; third and following segments with moderately prominent hairs; claspers with parallel sides, evenly rounded at tips. Tooth on hind coxæ small, but very acute. Wings with a large areolet; submedian cell slightly longer than the median.

Type from near Kingston, Jamaica, British West Indies.

This species resembles *E. montaguense* Ckll. from Guatemala, but differs in the form of the claspers. It agrees quite well in color with Cresson's description of *E. vitticolle* (Proc. Ent. Soc. Philadelphia, 1865, p. 53), but Cresson refers to the areolet as minute in *vitticolle,* while it is larger than usual in the present form.

Eiphosoma haitiense sp. nov. (Fig. 3).

♀. Length (extended) 11 mm. Head, thorax and anterior legs lemon-yellow, marked with black; abdomen and hind legs fulvous, varied with black. Antennæ 42-jointed, black except underside of scape and pedicel. Black body markings as follows: stripe above antennæ, half as wide as the front, including anterior ocellus; transverse spot enclosing posterior ocelli, narrowly separated from the frontal stripe; two almost contiguous spots on vertex, well separated from the ocellar spot; three stripes on mesonotum, the lateral ones narrowed behind; anterior margin of propodeum, suddenly enlarged laterally and almost contiguous with a lateral stripe extending back from the spiracle; median depression of propodeum; swollen part of petiole, a long stripe on mesopleura enlarged above, upper margin of second segment except tip, upper margin of third on anterior half and sheaths of ovipositor. Base and apex of hind femora above and hind tibiæ except for lighter middle part, fuscous; hind tarsi piceous. Wings strongly infuscated at apex.

Eyes barely convergent below; sides of front rather closely punctate; face sparsely so, especially toward the middle; malar space slightly shorter than the width of mandibles at base. Ocelli in a low triangle, the lateral ones much closer to one another than to the eye-margin from which they are removed by a little less than their own diameter.

Median lobe of mesonotum closely punctate anteriorly, lateral lobes shining, impunctate except for a very few punctures near the middle. Propodeum highly polished, the median depression broad but only moderately deep; anterior transverse carina at the basal third, angularly bent forward near the middle and extending to the front margin to form the sides of a small area that is closed behind by a short transverse carina; posterior transverse carina complete, sinuous; lateral carina below the spiracle complete; pro- and mesopleuræ highly polished, the latter with a few widely scattered punctures below. Apex of propodeum extending to the basal fourth of the hind coxa.

Petiole of abdomen rather strongly, but very gradually widened at apex, its spiracles at the posterior third not at all prominent. Ovipositor as long as the three basal segments of the abdomen taken together. Hairs on abdominal segments sparse and weak. Tooth on hind femora well developed, acute; spurs of hind femora subequal, barely over one-third the length of the metatarsus. Wings with a rather large oblique areolet; median and submedian cells of equal length.

Type from Cape Haitien, Haiti; collected by Dr. W. M. Mann.

This is similar to *E. aztecum* to which it will run in Cockerell's table[2] and in my own[3], but differs from the Mexican species by its much smaller size and in the color of the legs.

Dytiscus as a Destroyer of Mosquito Larvae (Col., Dipt.).

Larvae of dytiscids or diving beetles, the water tigers, have long been considered important enemies of the mosquito. Dr. J. B. Smith and others have performed laboratory experiments in which they showed that a single water tiger placed in a jar containing many mosquito larvae will kill or devour large numbers of them. Smith mentions (Report New Jersey State Agr. Exp. Station, 1904) a single experiment in which a water tiger killed or devoured 434 mosquitoe larvae in two days. He considers the water tigers as extremely important agents in the control of the salt marsh and fresh water mosquitoes.

The writer has observed in the field that many larvae are found in pools also occupied by the dytiscids. A few laboratory experiments showed that a single water tiger placed in a small jar containing many mosquito larvae did kill or devour tremendous numbers.

Three experiments were then performed in the laboratory using a few larvae only. Aquarium jars 11 inches in diameter and 7 inches in height were filled to about two-thirds their capacity with water. In each of them five water tigers were placed and were allowed to accustom themselves to their environment for a period of about an hour. Then to each of the jars were added 20 mosquito larvae of the second molt of the species *Culex pipiens*. At the end of 8 days jar No. 1 still contained 12 active mosquito larvae, jar No. 2 contained 9 living individuals and in jar No. 3 but 2 larvae remained. All the water tigers survived the experiment. Later experiments performed with single water tigers and the same number of mosquito larvae gave approximately the same results.

It would seem that the dytiscids may be of great importance in killing larvae when present in tremendous numbers, but that where the larvae are distributed pretty widely, there is little liability of their complete extermination by such an enemy.—F. E. Chidester, Rutgers College, New Brunswick, New Jersey.

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[2]Proc. U. S. Nat. Mus. vol. 46, p. 62. (1913).

[3]Psyche, vol. 18, p. 21 (1911).

New Species of Lopidea (Miridae, Hemip.)*

By Harry H. Knight, Ithaca, New York.

The writer here takes occasion to name and distinguish certain species of *Lopidea,* which are found in the eastern United States. In his studies on the structure of the male genitalia the writer has found characters which will give some structural basis for distinguishing the genus *Lopidea.* The broad and more or less flattened left genital clasper with bifurcated tip (figs. 1-3, 5), appears to be characteristic of all the species including *media* Say, the type of the genus. On the other hand, the structure of the right clasper gives a wide range of variation and thus good specific characters are obtained.

The genus *Lomatopleura* Reuter has supposedly been separated on the basis of the incrassate form of the second antennal segment. On that basis the writer has found it difficult to place one or two species in either *Lopidea* or *Lomatopleura* where the antennae are only slightly incrassate. The antennal character is further rendered more doubtful by the fact that each species in both genera has antennae of slightly different thickness. The thickness of the antennae has been found useful to separate the females of species which are otherwise very similar in coloration and structure. Thus far the writer has noted no difference in the thickness of the antennae between the sexes of a given species.

The species *caesar,* type of the genus *Lomatopleura* Reuter, has the same type of left genital clasper (figs. 1-3, 5) as that found in *Lopidea media* and other species of the genus as *robiniae, confluens* and *cuneata.* If *instabilis* were only the type of the genus *Lomatopleura* it might well stand on the basis of genital characters but unfortunately this is not the case. At present the writer prefers to consider all the species that have been placed under both genera as belonging to the genus *Lopidea* Uhler (1872).

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*Contribution from the Department of Entomology of Cornell University.

The figures of the male genital claspers are all drawn to the same scale.

Lopidea heidemanni new species. (Fig. 1.)

In general appearance, most closely resembling *media,* but larger and usually with more fuscous; certain color phases of the female sometimes difficult to distinguish from the females of *media.*

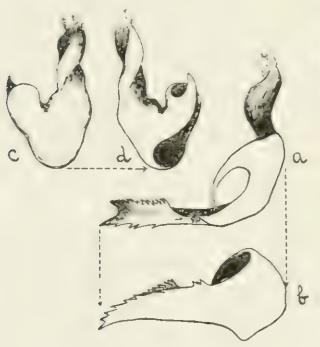


FIG. 1.

Fig. 1.—*Lopidea heidemanni*, male genital claspers—*a* right clasper, dorsal aspect. *b* right clasper, caudal aspect. *c* left clasper, ventral aspect. *d* left clasper, dorsal aspect.

FIG. 2.

Fig. 2.—*Lopidea salicis.* male genital claspers—*a* right clasper, dorsal aspect. *b* right clasper, caudal aspect. *c* left clasper, ventral aspect. *d* left clasper, dorsal aspect.

♂. Length 6.7 mm., width, 2.14 mm. Dark red, having more fuscous on the pronotum and scutellum than in *media*; larger and more elongate than *media,* the hemelytra always showing a strong tendency to shrivel and wrinkle longitudinally. The species may always be distinguished by the form of the male genital claspers (fig. 1); the right clasper showing a close relationship to *cuneata* and *salicis.*

♀. Length, 6.2 mm.; width, 2.08 mm. Slightly more robust than the male, otherwise very similar; the costal margins of the hemelytra frequently pale as in *media*; in certain color phases, dull orange red with fuscous.

Near Batavia, New York, the species was found breeding on elm (*Ulmus*), the nymphs feeding and maturing on the tender terminal growth, usually of young trees. At Four Mile, New York, nymphs were taken on Yarrow (*Achillea mille-*

folium) and when reared were found to be this species. This would indicate that the species has a wide range of food plants. The species was also taken in considerable numbers on *Solidago rugosa* in company with *media* where both forms were evidently breeding.

The species is named in honor of Mr. O. Heidemann, who was the first to recognize this form as an undescribed species. It is to be regretted that he never found time to publish on this and other forms that he knew.

Holotype: ♂, June 20, 1916, Batavia, New York (H. H. Knight); author's collection.

Allotype: topotypic.

Paratypes: 34 ♂ ♀ topotypic. 166 ♂ ♀ July 4-5, Four Mile; 3 ♂ 2 ♀ June 27, Honeoye Falls; ♀ June 27, Portage; ♀ July 16, Conesus Lake; ♀ June, 1911, Ithaca, all in New York and all collected by the writer. 2 ♂ 2 ♀ June 1, South Meriden, Connecticut, (H. Johnson). ♀ June 24, Bennington, Vermont, (C. W. Johnson). ♀ June 4, Westfield, New Jersey, (Wm. T. Davis). 2 ♂ ♀ June 4, Washington, and ♀ June 12, Brightwood, District of Columbia; ♀ Hensen Creek and ♂ May 24, Glen Echo, Maryland (O. Heidemann); also several other specimens in the Heidemann collection from the vicinity of Washington, D. C. 2 ♀ June, Black Mts., North Carolina (Beutenmüller). ♀ May 18, ♀ May 24, ♂ ♀ June 8, ♂ 2 ♀ June 17, Plummers Island, Maryland; ♂ May 19, Great Falls, and ♂ June 6, Mount Vernon, Virginia (W. L. McAtee). ♂ June 10, Tazewell, Virginia; ♂ Branchville to Beltsville, Maryland, (L. O. Jackson). 2 ♂ May 22, 23, Four Mile Run, Virginia; ♀ June 8, Conduit and Potomac Roads, Maryland, (A. Wetmore). ♂ May 31, Falls Church, and ♂ June 7, Great Falls, Virginia, (Nathan Banks). 2 ♂, Cleveland, Ohio.

Lopidea salicis new species. (Fig. 2.)

Closely related to *cuneata* but differs in the form of the male genital claspers and in having more orange color on the pronotum and sides of the hemelytra.

♂. Length, 5.7 mm.; width, 1.94 mm. Black, sides of the pronotum and basal angles of the disk orange colored; embolium and half of the cuneus yellowish to orange; species distinguished by the form of the male genital claspers (fig. 2).

♀. Very similar to the male in size and coloration, sometimes slightly more robust.

The species was taken by the writer only on the black willow (*Salix nigra*), and is apparently very scarce. The writer puzzled over the females for two years before the male was taken and the status of the species determined. The specimens from Honeoye Falls were taken on black willows found growing along the banks of a small stream that ran through an open pasture.

Holotype: ♂, June 27, 1916, Honeoye Falls, New York, (H. H. Knight); author's collection.

Allotype: taken with the type.

Paratypes: 2♂ 5♀, topotypic. ♀ June 30, 1914, Batavia, New York, (H. H. Knight). 2♀ June 23, 1914, Rochester Junction, New York, (M. D. Leonard).

Lopidea davisi new species (Fig. 3).

Short and robust, about the size of *media* but more robust; very similar to *confluens* in coloration.

♂. Length, 5.5 mm.; width, 2.0 mm. Yellowish orange to reddish; antennae, legs, front of the head and rostrum, black; calli, base of the pronotum, scutellum, clavus, inner half of the corium and the membrane, fuscous; species distinguished by the form of the male genital claspers (fig. 3).

♀. Very similar to the male only more robust.

This species is named in honor of Mr. Wm. T. Davis, who

FIG. 3.

Fig. 3.—*Lopidea davisi*, male genital claspers—*a* right clasper, internal lateral aspect. *b* left clasper, dorsal aspect.

FIG. 4

Fig. 4.—*Lopidea staphyleae*, male genital claspers—*a* right clasper, dorsal aspect. *b* left clasper, caudal aspect.

is noted for his wide interest in collecting, he having taken the first specimens of this species seen by the writer.

Holotype: ♂, June 20, Cabin John Run, Maryland (Wm. T. Davis); author's collection.

Allotype: topotypic.

Paratypes: ♀, Half Way Hollow Hills, Long Island, New York (Wm. T. Davis). ♂ 3♀ July 6, near Chevy Chase Lake, Maryland (W. L. McAtee). 2♂ June 20, 24, Great Falls; ♂ July 2, Glencarlyn, and ♂ ♀ July 13, 8♂ ♀ September 14, Falls Church, all in Virginia (Nathan Banks).

Lopidea reuteri new species. (Fig. 5.)

Very close to *caesar* in size and color but differing greatly in the form of the male genital claspers (fig. 5).

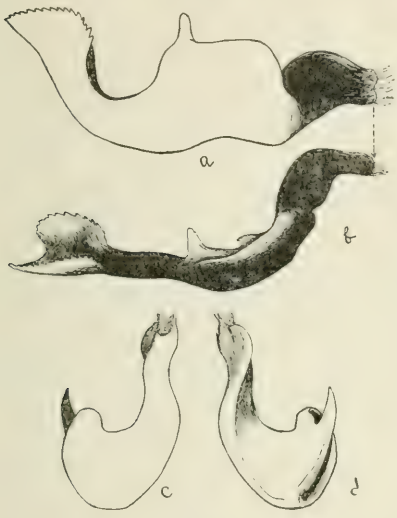


FIG. 5.

Fig. 5.—*Lopidea reuteri*, male genital claspers.
a right clasper, lateral aspect.
b right clasper, dorsal aspect.
c left clasper, ventral aspect.
d left clasper, dorsal aspect.

♂. Length, 7.1 mm.; width, 2.54 mm. Deep carmine red, fuscous on the scutellum and bordering the commissure of the hemelytra; not so broadly fuscous on the corium and cuneus as in *caesar*. Head mostly black, calli fuscous. Legs black; sternum, genital segment and usually the lower side of three adjoining segments blackish.

Antennae: segment I, length, .65 mm.; width, .17 mm.; II, 2.42 mm.; greatest width, .14 mm.; incrassate, tapering from the middle toward the apex; III, 1.60 mm., linear and slender; IV, .60 mm.; black, the first two segments clothed with prominent coarse hairs; almost identical in structure to *caesar*.

♀. Structurally and in color very similar to the male; no antennal differences between the sexes. Very hard to distinguish from the female of *caesar*, which species usually has less fuscous shading on the scutellum.

In Missouri the species was found breeding on witch-hazel (*Hamamelis virginiana*) and probably has the same food plant in the northern localities.

Holotype: ♂, July 22, 1915, Hollister, Missouri, (H. H. Knight); author's collection.

Allotype: taken with the male.

Paratypes: 2♂, 18♀, topotypic. ♂ July 22, Ramapo (Wm. T. Davis), and ♂ July 27, Lake George (A. K. Fisher), New York. ♂ July 16, Southbridge; ♂ Aug. 3, Sharon; 2♂ Aug. 8, Chester; ♀ Aug. 11, Fall River; ♂ ♀ Aug. 31, Rutland; ♀ Aug. 7, Williamsburg, all in Massachusetts, (C. W. Johnson). ♂ July 10, Portland (A. E. Moss), and ♀ Aug. 10, Portland (B. H. Walden), in Connecticut. ♀ July, Hewitt, and ♀ July, Newfoundland, New Jersey (Wm. T. Davis). ♀ Sept. 6, Red Rock, Luzerne Co., Pennsylvania (Wm. T. Davis). ♂ July 25, Glencarlyn, and ♀ July 25, Pæonian Springs, Virginia (Nathan Banks).

Lopidea staphyleae new species. (Fig. 4.)

Resembling *robiniae* in general appearance but slightly larger and not so black on the dorsum; the male genital claspers distinctive of the species (fig. 4). The claspers of this species are not typical of the genus *Lopidea,* but until more work is done on the genitalia in the various genera it does not seem wise to erect new ones.

♂. Length 6.5 mm., width 2.05 mm. Orange yellow, fuscous on the calli, narrowly at the base of the pronotum, scutellum, apical two-thirds of the clavus, inner half of the corium, and membrane; antennae, tylus, two bars on the front, base of the head, rostrum, and legs, black; the fuscous shading on the dorsum much paler than in *robiniae*; genital claspers distinctive of the species (fig. 4).

Antennae: segment I, length .71 mm.; width .15 mm.; II, 2.48 mm., width .10 mm., tapering slightly smaller toward the apex; III, 1.82 mm., slender and almost linear; IV, .52 mm.

♀. Length 6.8 mm., width 2.2 mm. Similar to the male in structure and coloration, but usually slightly larger. Sometimes very similar in size and coloration to the female of *confluens*; but the length of the first antennal segment in *confluens* is shorter than the width of the vertex, while in *staphyleae* its length is as great as, or slightly longer than, the width of the vertex.

Holotype: ♂, July 29, 1916, Batavia, New York (H. H. Knight); author's collection.

Allotype: July 30, topotypic.

Paratypes: 2♂ 5♀ July 18, ♀ July 20, ♀ July 21, all reared; 12♂ 33♀ July 29, 4♂ 6♀ July 30, 1916, ♂ July 23, 1913, Batavia, New

York, all collected by the writer. ♂ July 13, ♀ July 14, ♀ July 19, 2 ♀ Aug. 9, Plummers Island, Maryland; ♂ Aug. 2, Scott's Run, Virginia (W. L. McAtee). 2 ♀ June 27, Great Falls, Virginia; ♀ June 23, ♀ July 1, High Island, (Virginia?), (Nathan Banks).

This interesting species was found breeding on the American Bladder nut (*Staphylea trifolia*) from which its name is derived. The nymphs were found feeding on the tender foliage during July, 1916, north of Batavia, New York, the first adults maturing on July 18. The nymphs are bright orange yellow with legs and antennae black, being very large and robust in the fifth instar. It was noted that many of the adults left the host plant shortly after maturing and were found congregating on nearby hickory trees where several pairs were taken in copulation.

Lopidea staphyleae var. **sanguinea** new variety.

Male genital claspers not differing from the typical *staphyleae* but the yellow color replaced by bright red; much resembling *reuteri* and *caesar,* but differing in the thickness of the antennae.

♂. Size, structure of the antennae and male genital claspers not differing noticeably from the typical *staphyleae,* but the yellow coloration replaced by bright red.

♀. Similar to the male in structure and coloration; very much resembling the females of *reuteri* and *caesar*, but the more slender form of the antennae will serve to distinguish this variety.

Holotype: ♂, July 4, Brookline, Massachusetts; author's collection.

Allotype: July 24, Mt. Carmel, Connecticut (W. E. Britton).

Paratypes: ♂, topotypic; ♀ July 14, Mt. Tom, Massachusetts.

Changes of Address.

G. W. Barber to U. S. Ent. Laboratory, Hagerstown, Md.

J. E. Hallinen, Cooperton, Kiowa Co., Okla.

Dr. H. M. Parshley to Biological Hall, Smith College, Northampton, Mass.

M. R. Smith to Care of Truck Crop Insect Division, Bureau of Entomology, U. S. Dept. Agric., Washington, D. C.

A new Species of Apateticus from Louisiana (Hem., Het.).

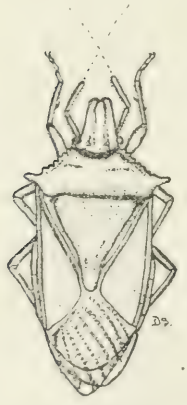
By Dayton Stoner, State University of Iowa, Iowa City, Iowa.

In a small collection of pentatomids recently sent me by Mr. O. W. Rosewall, of the Department of Zoology and Entomology, University of Louisiana, I found a very interesting and peculiar specimen which I was unable to satisfactorily determine. A short time ago I sent this specimen to Mr. H. G. Barber, who confirmed my suspicion that it might be a new species. It is quite unlike any of our other species of the genus *Apateticus* and displays some interesting features.

Apateticus ludovicianus new species.

Elongate, narrow; general color above pale brown with a slightly olivaceous tinge; head and anterior one-half of pronotum pale clay yellow; humeri produced into acute, rounded points; costal margin of hemelytra with a conspicuous ivory-white line extending from base to membrane; median ventral spine very short, blunt.

Head elongate, depressed, sides nearly parallel, the juga only very slightly surpassing the tylus; an impressed line either side of the tylus and just outside this and parallel to it is a rather regular row of black punctures extending from base of head to tip of tylus. Outside each of these rows is another row of punctures extending from base of head to near apex and which is partly interrupted by the reddish ocelli; these punctures gradually become smaller and a little before the apex of the tylus the rows on either side become confluent. Dorsal surface of the head between the rows of punctures impunctate with rather sparse but fine subtransverse lines. Lateral margins of head with a row of black punctures extending from eyes to apex. An irregular, iridescent, greenish mark, deeply and coarsely punctured on outer side of antennal tubercle in front of eye. Eyes prominent, fuscous. Antennae with basal segment very short, pale clay yellow, a greenish-fuscous patch on outer side, which is continuous with the greenish mark on the tubercle; second segment a little more than four times as long as the first, vandyke brown, becoming darker toward tip, covered with fine, pale yellowish hairs; third segment about as long as second, blackish, paler at base and very thickly covered with pale hairs. The remaining antennal segments are missing. Rostrum heavy, pale yellow, darker toward apex, which reaches just to posterior end of metasternum.



Apateticus ludovicianus n. sp.

Pronotum pale brown behind the humeri where the fuscous punctures are rather dense and uniform; basal half strongly convex; anterior half pale clay yellow, irregularly and less densely punctate; a smooth, pale, transversely elongate spot either side of the median line; the acute, rounded humeri which are not at all inclined forward are joined by a raised, pale, calloused ruga in which are a few punctures; lateral margins nearly straight, evenly crenulate; a submarginal row of deep black punctures begins at the anterior border behind the eyes and becomes gradually evanescent as it approaches the humerus which it does not attain. Below the margin a row of black punctures with greenish reflections extends for about the same distance posteriorly as does the row of black punctures above; side pieces of thorax deeply, sparsely punctate. Scutellum long, narrow, olivaceous, regularly and deeply punctate with fuscous, the punctures diminishing in size toward apex; a median longitudinal paler line on posterior half.

Hemelytra a little narrower than widest part of abdomen, slightly darker than scutellum, irregularly punctured; costal margin with a uniform ivory-white line extending from base to membrane, this line finely, sparsely, irregularly punctate with reddish brown; membrane hyaline, translucent, without longitudinal vitta.

Venter pale clay yellow, irregularly punctured with fuscous, more sparsely and lightly punctate on disk; black spots on mid-ventral line small but sharply defined; the first and second are at the anterior edges of the fourth and fifth visible ventral segments respectively, while the third is very narrow and elongate, extending backward about two-thirds the length of the last segment. Connexivum pale yellow; immaculate at the angles, bordered within by a green, iridescent, heavily punctured area.

Legs pale clay yellow, impunctate. Apical tarsal segments and under sides of two proximal segments black, the upper side of these two segments yellowish.

Length to tip of membrane, 16.6 mm.; width across humeri, 8.75 mm.; length of head, 2.9 mm.; length of rostrum, 6.3 mm.

Described from a single female specimen collected at Baton Rouge, Louisiana, May 24, 1916. The specimen is now in my collection.

The Determination of Generic Types in the Lepidoptera.

By Sir George F. Hampson, Bart., 62 Stanhope Gardens, London, S. W., No. 7.

In the News, Vol. xxvii, No. 9, pp. 393-400 (November, 1916) Mr. J. H. McDunnough gives a list of corrections of

the names of genera of *Noctuidae* from those used in my volumes in the "Catalogue of Lepidoptera Phalaenae in the British Museum." It is instructive to compare his paper with what he wrote in the "Contributions to the Natural History of the Lepidoptera of North America," Vol. 1, No. 6 (1912). The corrected names have since appeared in the most useful "Check List of the Lepidoptera of Boreal America," published by Dr. W. Barnes and himself. Many of his corrections are wrong, judged by his own method of selecting the types of genera as fixed by the "law of the first reviser." Of this, however, I will only give a single instance: in Haworth's description of the genus *Phytometra,* Lep. Brit., p. 254 (1809), the characters given for the genus include those of the larva and the generic name is taken from the habits of the larva. Now Haworth only knew the larvae of two of the species on his list, *festucae* and *gamma*, therefore one of them must be the type of the genus. Mr. McDunnough places both of them in the genus *Autographa* Hübn., and it was "ultra vires" on the part of Stephens and Westwood to "fix" the type of *Phytometra* as *oenea* = *viridaria* Clerck, of which Haworth did not know the larva, and Mr. McDunnough is wrong in following them. *Plusia* Treit., type *amethystina,* is the same as *Telesilla* H. S. and has priority over it as stated in my Vol. xiii, p. 452. Ochsenheimer's generic names in the *Noctuidae* are nondescript and should date from Treitschke's descriptions in 1825, except such as were described by Latreille, Nouv. Dict. Hist. Nat. xxiii (bef. Sept. 1, 1818) and Zineken in Ersch and Grüber, Allg. Encyc. Wiss., Vols. i, iii, iv (aft. Sept. 1, 1818); in the *Geometridae,* however, as Treitschke is naming Schiffermiller and Denis' sections in the Wien. Verz., his names will date from 1825 and not from 1827-8.

The "law of the first reviser" claims that the first reviser, even if he does not "fix" a type for the genus, restricts the available species of the original author's list to such species as have the characters of the part for which he uses the restricted name, and that if there is only one such species on the original author's list that species automatically becomes the type of the genus, and so on with subsequent revisers till a type is "fixed" agreeing with the characters given by the original author. It would therefore be necessary to know not only all the characters of each species on the original author's list but to follow them through each subsequent revision. It is, I think, only necessary to state this in set terms to prove the absurdity of "the law of the first reviser" as a practical working system.

The revisions of the older genera are scattered through hundreds of books and periodicals, many of which are extremely rare, and many are in the various editions of old Encyclopedias. The advocates of the law mostly little know the hopeless morass they would land themselves in when attempting to use it. What the law really means is that the generic names to which its advocates are accustomed are sacred and to justify their use they quote a mass of old authors so that it would take an expert with a complete library at his disposal a week to unravel each case he wished to prove or disprove.

The only practical system for an individual author is when the type of a genus is not stated or clearly indicated by its author to take the first species on his list which agrees with the characters he gives as the type. The only alternative to this, if the "law of the first reviser" is finally adopted, is that an International Congress shall first lay down clearly the principles on which the types of genera are to be selected (not the half-thought-out recommendations of the Monaco Congress), then appoint small committees of experts in each order to draw up and publish lists of the genera in which the types have not been stated with their types as fixed on those principles, and that the work should be so well done that it will command almost universal acceptance; this will certainly not be done in the lifetime of the present generation.

There is another matter which will have to be settled if zoological nomenclature is to be rescued from the almost hopeless muddle into which it has been allowed to drift by each author and country using the generic names to which they are accustomed without any guiding principles, and that, if nondescript generic names are to be accepted or not, and, if not, whether they are to be considered as preoccupying the name for future use. In the whole of zoology these nondescript generic names are, I believe, used solely by the micro-lepidopterists and by some other American authors; the decision in this matter is of almost equal importance with that of the method of "fixing" the types of genera.

I am glad to see that Mr. McDunnough in the preface to Dr. Barnes and his Check-List of North American Lepidoptera discards Hübner's "Tentamen," but the status and date or dates of publication of Hübner's "Verzeichniss" is of far greater importance. The real genera for which structural characters are given in the "Verzeichniss" are the "Stirps" and Hübner's lower divisions, "Familiae" and "Coitus," are mere form and color sections and so considered by Hübner himself, and should

not, strictly speaking, be treated as generic names. In fact, Hübner's nomenclature, as also that of Linné, is only called binomial by a time-honored fiction. It is instructive to note that many of the old authors used the term "Family" as a subdivision of "Genus," as indeed is its proper meaning.

The date, or dates, of the publication of the "Verzeichniss" have always been open to much doubt and the dates given by D. Sherborn and L. B. Prout in the "Annals and Magazine of Natural History" (8), ix, pp. 179-80 (1912) are merely the approximate dates of the printing off of the various parts and not of their issue. As clearly pointed out by S. H. Scudder in his "Historical Sketch of the Generic Names Proposed for Butterflies," Salem, 1875, pp. 95-8, Hübner, in his preface to the first century of the "Zütrage," p. 5, dated December 22, 1818, refers to a work of the nature of the "Verzeichniss" as an unpublished desideratum and further not only are all the butterflies (with a few exceptions) of the first century of the "Zütrage" referred to by number in the "Verzeichniss" but a species—*Lycus niphon*—figured in the second century, which is dated December 23, 1822, is referred to both by number and name. Yet Scudder uses the date 1816 "for mere convenience and uniformity." The first two dates given by Sherborn and Prout, 1816 for pages 1-16 and 1818 for pages 17-80, are, therefore, proved to be erroneous. In 1820 Hübner stated that it was getting on very slowly; in 1825 he stated in Franck's Catalogue that 18 Bogen, i. e., 288 pages, were on sale (? printed off and ready for sale). In "Isis," xx, p. 103 (January 1827), there is a review of the "Verzeichniss" complete except for the Anzeiger (Index) of 72 pages. (?, an advance copy whilst the index was being prepared). There is no mention of the "Verzeichniss" in contemporary literature, such as the "Allgem. Liter. Zeitung," with its reviews of the scientific work of the period, before 1828, when Treitschke begins to quote it in his Vol. vi (2), p. 72, after which he quotes it regularly. Ochsenheimer in the preface to his Vol. iv, p. 8 (1816) says that he had not seen a copy of Hübner's "Tentamen" till after his Vol. iii (1810) was in print; otherwise he would have quoted it before, and he quotes the genera from that date, therefore there was no prejudice against Hübner's methods as has been alleged. The only conclusion to be drawn is that no part of the "Verzeichniss" was published till some time in 1827 by Geyer after Hübner's death, and all the evidence there is is against its having been published before that date, which should be accepted unless some independent contemporary evi-

dence turns up. Plenty of copies exist in the original state of issue. They are all in a single blue paper wrapper without any printing on it, none in several wrappers.* Stephens in his "Ill. Brit. Ent. Haust.," Vol. iv, p. 386 (1835) has a note on the "Verzeichniss" and gives an abstract of it and says that he had not been able to obtain it before; after this he quotes it systematically.

American authors, in the *Lepidoptera* at all events, and, I believe, universally, are to be congratulated on not having adopted the insidious German specific polynomial nomenclature, by which the specific name is broken up even unto the sixth degree (*vide* R. Verity's "Rhopalocera Palaearctica"), to which we in Britain have to a considerable extent succumbed of late years. There is no necessity whatever to give names to local, seasonal, sexual, polymorphic, hybrid, etc., forms, though in dealing with a species its local and other varieties should of course be described. There is no such thing in nature as a subspecies, if a form is not connected by intergrades with its nearest ally in another locality and does not interbreed with it, then it is a species; if this is not the case then it is a variety, geographical or otherwise, and the term "subspecies" is merely a confession of ignorance as to whether a form is a species or variety. The naming of minor varieties is rapidly reducing the whole subject to an unworkable farce and it is to be hoped that one of the minor benefits of the present war will be that we in Britain will return to a simple binomial nomenclature and purge ourselves from this form of "Kultur."

* Extract from letter dated November 12, 1894, from Sir M. Holzmann, librarian at Marlborough House, to H. M., the late King Edward VII, to the Lord Walsingham in reply to enquiries as to the dates of Hübner's works, as to the results of his enquiries at the Berlin Royal Library.

"As nothing is said about the works being in their original wrappers, I conclude this is not the case. I confess that from the beginning I had my doubts on this point, as I know that in Germany books appearing gradually in parts used very rarely to be published in wrappers, but if so the wrappers had no printing at all. Even up to so late a time as 50 or 40 years ago the parts were issued just as they came from the press, each sheet separate, not even stitched or properly folded, and frequently with the title page and date of publication on the first sheet, although the last sheet might come out years after the publication of the first. I, myself, have bought many books in that condition when it is, of course, quite hopeless to attempt fixing the actual date of issue of each part."

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., DECEMBER, 1917.

The Convocation Week Meetings.

The annual meetings of the various national societies whose interests are wholly or partly entomological are announced for Pittsburgh and for Minneapolis.

At Pittsburgh will meet:

The Entomological Society of America on Friday and Saturday, Dec. 28 and 29; Secretary, Prof. J. M. Aldrich, West Lafayette, Indiana:

The American Association of Economic Entomologists on Monday, Tuesday and Wednesday, Dec. 31, Jan. 1 and 2; Secretary, Mr. A. F. Burgess, Melrose Highlands, Massachusetts:

The American Society of Naturalists on Tuesday and Wednesday, Jan. 1 and 2; Secretary, Prof. B. M. Davis, University of Pa., Philadelphia, Pennsylvania:

The Ecological Society of America on Saturday, Dec. 29, Monday, Dec. 31, and Tuesday, Jan. 1: Secretary, Dr. Forrest Shreve (address, Nov. 1-Dec. 27: Easton, Maryland):

These four societies meet in affiliation with the American Association for the Advancement of Science whose sessions extend from Friday, Dec. 28 to Wednesday, Jan. 2, both inclusive: Secretary, Dr. L. O. Howard, Smithsonian Institution, Washington, D. C.

At Minneapolis (University of Minnesota) will meet:

The American Society of Zoologists on Thursday, Friday and Saturday, Dec. 27-29; Secretary, Prof. Caswell Grave, Johns Hopkins University, Baltimore, Maryland:

On the same days will occur the meetings of the Federation of American Societies for Experimental Biology and the American Association of Anatomists.

Additional expenses of various kinds, including that of railroad fare, will doubtless disincline many from being present at these meetings, but the various Secretaries rightly urge the duty of attendance in view of the special stress of the times and the necessity for upholding scientific associations.

In recent years the NEWS has given, usually in its February number, a classified list of all the papers of an entomological bearing presented at the preceding Convocation week meetings. Owing to our reduced size in 1918, as announced in our November issue, page 424, this list will be omitted next year, but we hope to give the usual brief summary and statistics of papers.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Entomology in British Columbia.

I am having sent to you a copy each of the Annual Report of the British Columbia Provincial Museum of Natural History for 1915 and 1916. The latter has only just come off the press. These reports contain illustrations of some of our rare and uncommon British Columbian insects and I thought that they may be of interest to you, especially as some of the figures are types and paratypes which are here illustrated for the first time. For the past two years I have been looking after the entomological branch of the Provincial Museum in my spare time. This branch had been rather neglected previously, but is now assuming a more complete aspect. I have persuaded the Director to have at least two plates each year devoted to the illustrating of rare and uncommon insects occurring in the Province, and as the general aspect of the report has been altered, I think that it may prove of some value to entomologists in general.—E. H. BLACKMORE, *President*, British Columbia Entomological Society, Victoria, B. C.

[The Report for 1915 notes the insect collections made by E. M. Anderson at Atlin in 1914 and at Sahtlam, Vancouver I., in 1915; by J. A. Munro at Okanagan Landing and C. Garrett at Cranbrook. Of the well-printed half-tone plates, one is devoted to types and paratypes of Geometridae described elsewhere by L. W. Swett, two to rarer butterflies (chiefly) and one to three new species of B. C. Diptera, described elsewhere by C. H. T. Townsend. The Report for 1916 indicates that Mr. Anderson made insect collections in the vicinity of Lilloett while Mr. Munro continued his work at Okanagan Landing; it contains also records of Noctuids from the vicinity of Victoria and of Geometridae from various B. C. localities by Mr. Blackmore. To each of these families a half-tone plate is devoted. We heartily second the hope expressed by Mr. Blackmore in another place in his letter that the B. C. Entomological Society may, in spite of its difficulties, soon issue numbers 8 and 10 of its Bulletin.—ED.]

Emergency Entomological Service.

Numbers 6 and 7 of these Reports, similar to the earlier issues mentioned in the NEWS (*c. g.* Oct., 1917, page 375), dated Oct. 1 and Nov. 1, contain descriptions of the clean-up operations at Hearne, Texas, to exterminate the pink boll worm (*Pectinophora gossypiella*), presumably introduced with cotton seed from the Laguna district of Mexico. This pest was found in two fields near Hearne. Federal and State appropriations render it possible to establish a cotton-free zone as rapidly as the need of such a zone can be shown.

The present year has been one of the lightest boll weevil years since the pest entered the country. The first record of this species in South Carolina is given and data on the northern line of dispersion in Texas, Oklahoma, Arkansas, Tennessee, Alabama and Georgia; a complete statement of the infested territory, together with a map, is promised as soon as all the data have been received and compiled.

In California cotton has suffered materially from the activity of three sucking bugs, *Euschistus impictiventris, Chlorochroa sayi* and the tarnished bug, *Lygus pratensis,* which puncture the carpels and the green seed, resulting in complete destruction of the embryo, serious discoloration of the lint and premature opening of the bolls.

The State of Florida has issued a quarantine against sweet potatoes infested by the weevil *Cyclas formicarius* which occurs only in a few counties but is gradually gaining ground. The Federal Horticultural Board has under consideration a quarantine against sweet potatoes and yams from all foreign countries and from Hawaii and Porto Rico in view of the widespread ravages of this species and of the weevil *Euscepes batatae.*

Extension work in Entomology is being planned in States as far apart as Arizona and New Hampshire; this aims to give demonstrations at many places of the measures necessary to check or forestall insect ravages.

Numerous reports of injury to stored corn and wheat indicate that the more common grain weevils will be unusually prevalent during the coming winter.

The Bureau of Entomology's work is revealing the great economic importance of North American termites as destroyers of timber.

There are the usual reports on many spieces of injurious insects from 11 states in No. 6 and 22 states and territories in No. 7. We quote from one of these by Mr. A. L. Melander in No. 6: "I have just [September 18th] returned from an extended scouting trip which began about the middle of June. During the summer we have covered nearly 4000 miles, practically all in Washington, and over 3300 have been done by the little automobile. . . . In the State of Washington, [the weevil] *Otiorhynchus ovatus* extends from north to south along a strip east of Puget Sound, invading the islands and

extending westward to Montesano. Most of the strawberry fields of this region are infested. In the region immediately east of Seattle, where the insect first entered the State fifteen years ago, the berry industry has been taken over almost entirely by Japanese who shift their fields as the weevils kill their plants. . . . Commercial cranberry growing in this State, although in its infancy, has already totaled over a million dollars invested. The principal trouble is occasioned by the fire worm which, in its several generations, drops the leaves, buds, blossoms and fruits, destroying not only the year's crop but, by attacking the terminal buds, prevents the next year's berries from forming. The growers certainly need advice and assistance as much as any people can. They are enthusiastic but helpless before this insect. They have equipped their bogs with piping and have installed engine sprayers so as to be in a position to carry on excellent spraying, but what is best and safest to use and just when the spraying should be applied are unsolved problems for which the growers are crying for professional advice, especially since this year their avertable losses have amounted to hundreds of thousands of dollars. . . . Perhaps the most valuable part of the summer's expedition was the information received and given during the personal visits with hundreds of farmers. The car enabled me to get off the beaten tracks and to run down scores of reported insect problems. With the camp outfit carried along we were made independent of hotels and railroads and thus were enabled to reach into many a region I never before have had the opportunity of visiting."

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico is given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

1—Proceedings, Academy of Natural Sciences of Philadelphia. **3**—The American Naturalist. **4**—The Canadian Entomologist. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Nature, London. **11**—Annals and Maga-

zine of Natural History, London. **21**—The Entomologist's Record, London. **51**—Novitates Zoologicae, Tring, England. **68**—Science, New York. **87**—Bulletin, Societe Entomologique de France, Paris. **105**—Videnskabelige Meddelelser, Naturhistoriske Forening i Kjobenhaven. **121**—Archives des Sciences Physiques et Naturelles, Geneva. **150**—Transactions, Royal Society of Edinburgh. **153**—Bulletin, American Museum of Natural History, New York. **169**—"Redia," R. Stazione di entomologia Agraria in Firenze. **177**—Quarterly Journal of Microscopical Science, London. **179**—Journal of Economic Entomology. **189**—Journal of Entomology and Zoology, Claremont, Calif. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **204**—New York State Museum, Albany. **304**—Annals, Carnegie Museum. **313**—Bulletin of Entomological Research, London. **344**—U. S. Department of Agriculture, Washington, D. C. **411**—Bulletin, The Brooklyn Entomological Society. **420**—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington. **490**—The Journal of Parasitology, Urbana, Illinois. **532**—Proceedings, National Academy of Sciences of the United States of America, Washington. **538**—Lorquinia. Los Angeles. **540**—The Lepidopterist, Official Bulletin, Boston Entomological Club. **546**—Illinois Biological Monographs, Urbana. **551**—Memorie, Pontifica Accademia Romana dei Nuovi Lincei, Rome. **552**—Science Progress, London. **553**—Florida Buggist, Gainesville, Fla.

GENERAL SUBJECT. Cameron, S. E.—The insect association of a local environmental complex in the district of Holmes Chapel, Cheshire, England, **150,** lii, 37-78. **Chandler, W. J.**—Investigations of the value of nitrobenzol as a parasiticide with notes on its use in collecting external parasites, **490,** iv, 27-32. **Chapman, T. A.**—Two males paired with one female, **21,** 1917, 182. **Davis, A.**—Insect collecting on a mountain trail, **538,** ii, 17-18. **Felt, E. P.**—Household and camp insects, **204,** Bul. 194. **Gibbs, A. E.**—Obituary notice, **9,** 1917, 95. **Grinnell, F.**—The spirit of the naturalist and of natural history work; a suggestion for observation and record, **540,** i, 53-4; 70. **Krogh, A.**—Injection preparation of the tracheal system of insects, **105,** lxviii, 319-22. **Meyrick, E.**—A question of Latinity, **9,** 1917, 114-5. **Pickard-Cambridge, O.**—Obituary notice, **9,** 1917, 96. **Rowland-Brown, H.**—Insect disappearances and reappearances, **9,** 1917, 92-4. **Wodsedalek, J. E.**—Five years of starvation of larvae, **68,** xlvi, 366-7. **Waterhouse, C. O.**—Obituary notice, **9,** 1917, 71-2.

PHYSIOLOGY AND EMBRYOLOGY. Gatenby, J. B.—The degenerate sperm-formation of moths as an index to the inter-

relationship of the various bodies of the spermatozoon, **177,** lxii, 465-88. **Muller, H. J.**—An oenothera-like case in Drosophila, **532,** iii, 619-26. **Taylor, M.**—The chromosome complex of Culex pipiens. II, Fertilisation, **177,** lxii, 287-301. **Warren, D. C.**—Mutations in Drosophila busckii, **3,** li, 698-703.

MEDICAL. Wilson, E. E.—The anopheles mosquito in relation to Malaria and agriculture, **553,** i, 18-19, 22-3.

ARACHNIDA, ETC. Berlese, A.—Centuria di Acari nuovi. I-III, **169,** xii, 19-67; 125-177; 289-338. **Chinaglia, L.**—Revisione del gen, "Hydrozetes," **169,** xii, 343-59. **Cohen, H.**—Vitality of lice, **10,** C, 66-7. **Savory, T.**—Further notes on captive spiders, **552,** 1917, 322-24.

Ewing, H. E.—[Six] new sps. of economic mites, **179,** x, 497-501.

NEUROPTERA, ETC. Hirst, S.—Remarks on certain sps. of the genus Demodex (of man, the horse, dog, rat and mouse), **11,** xx, 232-5. **Longinus Navas, R. P.**—Neuroptera nova Americana, **551,** ii, 59-80. **Tillyard, R. S.**—The biology of dragonflies. (Cambridge Univ. Press), 396 p. **Williams, C. B.**—A new thrips damaging orchids in the West Indies, **313,** viii, 59-61.

ORTHOPTERA. Hebard, M.—Dermapterological notes; Notes on Mexican Melanopli, **1,** 1917, 231-50; 251-75. **Rehn & Hebard**—Studies in West Indian earwigs, **153,** xxxvii, 635-51.

HEMIPTERA. Baker, A. C.—Some sensory structures in the Aphididae, **4,** 1917, 378-84. The correct name for our apple-grain aphis, **68,** xlvi, 410-11. **Bodkin, G. E.**—Notes on the Coccidae from Br. Guiana, **313,** viii, 103-10. **Gibson, E. H.**—The collection of Hemiptera in the U. S. Nat. Mus., **179,** x, 502-3. **Gregory, L. H.**—The effect of starvation on the wing development of Microsiphum destructor, **198,** xxxiii, 296-303. **Heidemann & Osborn**—Rhynchota of the Isle of Pines, **304,** xi, 346-55. **McAtee, W. L.**—A few notes chiefly on the names of Nearctic Tingidae, **411,** xii, 78-9. **Newstead, R.**—Observations on scale-insects, IV, **313,** viii, 1-34.

Ferris, G. F.—A new genus and sp. of Coccidae, **4,** 1917, 375-8. **Gibson, E. H.**—The family Isometopidae as represented in N. America [3 new], **411,** xii, 73-7. **Guercio, G. del.**—Contribuzione alla conoscenza degli afidi [1 new], **169,** xii, 197-277. **Knight, H. H.**—Notes on species of Miridae inhabiting ash trees, with description of a new sp., **411,** xii, 80-2.

LEPIDOPTERA. d'Auriol, H.—Etude sur les Pierides du Jura, **121,** 1917, 32-47. **Benedict, R. C.**—An outline of the life history of

the clothes moth, Tineola biselliella, **68,** xlvi, 464-6. **Cassino & Reiff**—New L. from the Jacob Doll collection, **540,** i, 68-9. **Clarke, A. F.**—Butterfly v. wasp, **10,** C, 85. **Grinnell, F.**—Lorquin's admiral (Basilarchia lorquinii), **538,** ii, 20-21. **Hampson, G. F.**—Descriptions of new Pyralidae of the subfamilies Hydrocampinae, Scoparianae, etc., **11,** xx, 265-82. **Joicey, J. J.**—New sps. and forms of Sphingidae, **11,** xx, 305-9. New subspecies of Caligo, **21,** 1917, 180-2. **McClymont, J. R.**—Remarks on evidences of intelligence in certain butterflies, **9,** 1917, 212-3. **Marchand, W.**—Entomological notes, **540,** i, 70-71. **Mott, G.**—Cold destroys lepidoptera larva and eggs in So. Florida, **540,** i, 69. **Ottolengui, R.**—The reminiscences of a lepidopterist, **540,** i, 85-7. **Prout, L. B.**—New South American Geometridae, **51,** xxiv, 374-92. **Reiff, W.**—Colias philodice, rothkei, **540,** i, 84. **Reiff & Cassino**—Two weeks at Rockledge, Florida, **540,** i, 59-61, 72. **Rowland-Brown, H.**—Collateral colour variation of Argynnids. Resting habit of Pierids, **9,** 1917, 207. **Skinner, H.**—The species of Argynnis in America, **4,** 1917, 342-4. **Stowers, N.**—A sugaring trip for Catocalas, **540,** i, 87-9.

Barnes & McDunnough—Some pyralid notes [1 new], **4,** 1917, 371-4. **Cassino, S. E.**—New sps. of Catocala [3 new], **540,** i, 61-4. **Dyar, H. G.**—Descriptions of some L. larvae from Mexico; A new Pyralid from California. **420,** V, 128-32. **Ehrmann, G. A.**—Some new No. American butterflies [2 new], **540,** i, 54-6. **Grinnell, F.**—Two unnamed California butterflies, **4,** 1917, 349-51. **Swett, L. W.**—Geometrid notes [1 new], **4,** 1917, 351-2. New Geometrids [2 new], **540,** i, 52-3.

DIPTERA. Dyar & Knab—Notes on Aedes curriei, **420,** v, 122-5. **Howard, C. W.**—Hibernation of the house-fly in Minnesota, **179,** x, 464-68. **Howard & Hutchison**—The house-fly, **344,** Farm. B., 851. **Kahl, H.**—Notes on the genus Leucophenga with descriptions of some new species from So. America, West Africa, and the Philippine Islands, **304,** xi, 364-393. **Malloch, J. R.**—The anthomyid genus Phyllogaster, Addendum, **4,** 1917, 352. **Marchand, W.**—An improved method of rearing tabanid larvae, **179,** x, 469-72. **Nielsen, J. C.**—Undersogelser over entoparasitiske muscidelarver hos arthropoder, VI, **105,** lxviii, 23-36.

Dyar, H. G.—The mosquitoes of the Pacific northwest [3 new]; Notes on Aedes at Lake Pend d'Oreille, Idaho; Notes on the Aedes of Montana [2 new]; A new Aedes from the Rocky Mountain region, **420,** v, 97-121; 127-8. **Johnson, C. W.**—Species of the genus Brachyopa of the eastern U. S. [2 new], **4,** 1917, 360-2. **VanDuzee, M. C.**—New No. Am. species of Dolichopodidae [5 new], **4,** 1917, 337-42.

COLEOPTERA. Achard, J.—Descriptions de deux Chrysomelides nouveaux de l'Amerique du Sud, **87,** 1917, 230-1. **Chagnon, G.**—A preliminary list of the insects of the Province of Quebec, III. Coleoptera (Suppl. Rept. Quebec Soc. Protect. Plants), 161-277. **Champion, G. C.**—A new barid from a Costa Rican bromeliad, **8,** 1917, 223-4. **Nicolay, A. S.**—Buprestidae and Cerambycidae from Maine, **411,** xii, 92-5. **Notman, H.**—Coleoptera illustrata, Vol. 1, No. 3, Carabidae, 50 pls. **Shelford, V. E.**—Color and color-pattern mechanism of tiger beetles, **546,** iii, No. 4, 134 pp. **Tower, W. L.**—Inheritable modification of the water relation in hibernation of Leptinotarsa decem-lineata, **198,** xxxiii, 229-57.

Chapin, E. A.—Studies in the Hydnocerini. The hydnoceroid genera [2 n. g. 1 n. sp.], **411,** xii, 83-5. **Fall, H. C.**—New Coleoptera, VII [7 new], **4,** 1917, 385-91. **Schaeffer, C.**—On some new and known Melandryidae [4 new], **4,** 1917, 357-60.

HYMENOPTERA. Berlese, A.—Aspidiotiphagus How. e Prospaltella Ashm., **169,** xii, 1-13. **Bray, H.**—List of bees from Claremont, Laguna region, **189,** ix, 93-100. **Cockerell, T. D. A.**—Descriptions and records of bees, LXXVI-LXXVII, **11,** xx, 235-41, 298-304. **Frohawk, F. W.**—Destruction of wheat by wasps, **9,** 1917, 132-3. **Girault, A. A.**—A new West Indian chalcid-fly, **4,** 1917, 356-7. **Malenotti, E.**—Sopra un caso di endofagia dell' "Aspidiotiphagus citrinus" sul "Chrysomphalus dictyospermi," **169,** xii, 15-18. **Waterson, J.**—A n. sp. of Paraphelinus, from Br. Guiana, with a discussion of the genus and the allied Aphelinus, **313,** viii, 43-58.

Beutenmüller, W.—Descriptions of new Cynipidae [5 new], **4,** 1917, 345-9. **Girault, A. A.**—Descriptiones hymenopterorum chalcidoidicorum cum observationibus [2 new], **9,** 1917, 36-8. Three new chalcid flies from N. America. New chalcid flies, with notes [10 new], **411,** xii, 85-89. **Malloch, J. R.**—Three n. sps. of the new genus Andrena from the U. S., **411,** xii, 89-92.

The Biology of Dragonflies (Odonata or Paraneuroptera) by R. J. Tillyard, M. A. (Cantab.) B. Sc. (Sydney), Macleay Fellow in Zoology to the Linnean Society of New South Wales, Cambridge [England]: at the University Press 1917. New York representatives: G. P. Putnam's Sons. 8vo, pp. xii, 396, 4 pls. (2 colored), 188 text figs. Price 15 shillings net. (Cambridge Zoological Series, General Editor: Arthur E. Shipley, Sc.D., F.R.S., Master of Christ's College, Cambridge).

This volume whose appearance was alluded to in the News for October, page 353, contains the most complete general account of the Odonata ever published. Many of its contents are very suggestive and a much longer time must elapse before they can be properly

considered and tested. Such consideration might easily postpone the writing of an adequate review until the volume no longer had the charm of novelty, but we feel that it would be an injustice to the talented author, to his originality and his industry, to defer calling it to the attention of American entomologists until the reviewer felt that he had even partially digested its contents.

The book is an essential to every biological, zoological or entomological library. Its scope is shown by the following table of contents: Chapter I. Introduction, 8 pages; II. The Imago, external features and skeleton, 29 pp.; III. The Wings, 29 pp.; IV. The Larva or nymph, 33 pp.; V. The Alimentary and Excretory systems, 20 pp.; VI. The Nervous system, 17 pp.; VII. The Sense organs, 20 pp.; VIII. The Circulatory system, 9 pp.; IX. The Respiratory system, 36 pp.; X. The Bodywall and Muscles, 10 pp.; XI. The Reproductive system, 17 pp.; XII. Embryology, 14 pp.; XIII. Coloration, 15 pp.; XIV. Classification, 23 pp.; XV. Zoogeographical distribution, 20 pp.; XVI. The Geological record, 20 pp.; XVII. Bionomics, etc., 17 pp.; XVIII. British species [included presumably on account of the book forming one of the series above mentioned], 15 pp.; XIX. Collecting, rearing and biological methods, 10 pp.; Appendix A. Bibliography, 13 pp.; B. Glossary, 5 pp.; C. Some important synonyms, 1 p. Index of illustrations, 4 pp., Index of text, 12 pp.

Among the novelties adopted* may be mentioned the suggested phylogenetic succession of the pterostigma (pp. 52-53) and of the abdominal appendages of the imagos (pp. 35, 37); the view that the original Odonata were anisopterous as the Protodonata were (pp. 49, 51), that the basal fusion of veins *R* and *M* "was probably brought about, like the reduction in *Sc*, by the adoption of the aquatic habit by the larva, and the consequent shifting of the course of the oxygen supply of the developing wing from the costal to the anal end of the alar trunk," "owing to the larval gills being situated at the anal end of the body" (pp. 56, 46); the figuring of the hatching of the larva of *Anax* (p. 68); the treatment of the rectal gills of the larvae of the Anisoptera (pp. 178 *et seq.*), of their ontogeny (p. 186) and of the caudal and lateral gills of Zygopterous larvae (pp. 190-200); the phylogenetic treatment of color patterns (pp. 246 *et seq.*); the

* Many of these, indeed, have already appeared in Mr. Tillyard's numerous papers in the *Proceedings of the Linnean Society of New South Wales* for recent years, and in the *Journal of the Linnean Society of London*, Zoology, vol. xxxiii. Mr. Tillyard's interpretations of certain venational features are not discussed in this review; they have been criticised by Prof. Needham in the NEWS for April last, pp. 169-173, and by Mr. Campion in a review of the present book in *The Entomologists' Monthly Magazine* for September, pp. 212-215.

correlation of colors with habits both imaginal and larval (pp. 248, 256), including change of color in the larva induced by color changes in its environment; in chapter XIV, alterations is classification whereby the family Lestidae is separated on entirely new characters, the genus *Epiophlebia* of Japan being included therein, and the elevation of many of de Selys' legions to the rank of subfamilies; the discussion of zoogeographical distribution under the headings of the palaeo-, ento- and ectogenic faunae (chap. xv); a new phylogenetic diagram (p. 319); an estimate of the flight-speed of dragonflies which in *Austrophlebia* is placed at "nearly sixty miles per hour" (p. 323).

Admirable features are the numerous original illustrations, some of them due to Mrs. Tillyard, the great majority of all the figures in the book having been made by the author from new material, as those of many wings, larvae, parts of the nervous system, sense organs and many viscera; the elaborate tables of equivalents in nomenclatures of wing-veins and -areas (pp. 40-43), of the muscles of the entire body of the imago (pp. 206-209) and of the census of the Odonata of the world (p. 300) in which the total number of species is placed at 2457 in 429 genera.

So excellent is this book that the reviewer wishes for it a wide and an intensive use and he would fail in his duty if he did not point out some details which seem to him to require correction, that it may be of the greatest value. The first sentence of chapter I implies that Linnaeus recognized a *family Libellulidae,* but Linnaeus' categories included no families and no group names terminating in *idae*; these are post-Linnean. Baron Edmond de Selys-Longchamps died December 11, 1900, not in 1890 (p. 2).

In the table on p. 92, the—sign for the appendix dorsalis in the column "Imagines Zygoptera" should be replaced by a X sign for "rudimentary" (cf. Hagen & Calvert, Bull. Mus. Comp. Zool, xxxix, pl. I, figs. 18 and 18*c* and explanation thereof, p. 119, under *v*). The statement that "In Zygopterid larvae the rectum is undivided" (p. 101, footnote) will require some modification, as work by Mr. Mitchell Carroll, not yet published, shows. The problem of "the missing abdominal ganglion," stated (p. 132) as solved in *Petalura*, had been solved in 1903 in the note cited as No. 28 of the bibliography on page 364.

Those interested in the physiology of the nervous system (pp. 135-136) will find additional data in the work of Babak and Foustka (1907) and of Matula (1911), as well as in Babak's summary in Winterstein's great *Handbuch der vergl. Physiologie* (1912-13). The expression "Closed System" applied to the dorsal vessel hardly seems appropriate, since the latter is truly said to open "into the haemocoele" (p. 157). Contributions to knowledge of spermatogenesis (p. 213) have been made since Bütschli by Lefevre and McGill (1908, 1912)

and by Gross (1912). In the discussion of germ bands (p. 233), the fact that other Odonate embryos than the one chiefly described (*Calopteryx*) have not immersed, but superficial, germ bands is not mentioned. Brandt's text and figures (reproduced as G and H on p. 231), as well as a consideration of the mechanics involved, necessitate the thickening and contraction of the serosa *after*, and *not before* (p. 238), the rupture of the fused amnion and serosa. The length of embryonic life is often more than three weeks (p. 242), in countries with a marked winter; the reviewer is accustomed to obtain young larvae of *Sympetrum vicinum* in Philadelphia for class work from eggs laid in late September or early October: kept indoors, these hatch in December and January; in their natural surroundings the embryonic period must be still longer. Semi-Arians of the twentieth century may reject Mr. Tillyard's "homochrome" (pp. 254, 257) for "homoeochrome," but, irrespective of orthodoxy, it may be questioned why "heteromorphic" should be employed in the sense of "rarer" (p. 257).

The characters for many of the taxonomic groups given in chapter XIV, such as "Triangles short" or "Triangle not excessively narrowed," without any accompanying mention of some neighboring structure or detail to be used as a scale in measuring the shortness or the narrowing, are not sufficiently precise to be available for purposes of identification, however meaningfull they may be to those already acquainted with the Odonata. The non-comparative nature of the tribal characters of the Libellulinae (pp. 269-273) makes determination of specimens exceedingly difficult, if not impossible. There is not space within the limits of this review to discuss the classification itself.

"Nebraska" (p. 282) is an error for "Nevada," and "*Diastatomma* Brauer" (p. 307, footnote) for "*Diastatomma* Burmeister-Charpentier." The fact that one specimen of *Phenacolestes parallelus* has been found with wings outspread* does not seem to the reviewer to justify the conclusion that this extinct genus used to rest in that position (p. 315). The condition shown by the fossil may only mean that the insect had been softened by water and its wings floated out into the attitude in which they are now found. Mr. Tillyard's own observations that females emerge, on the average, a few days before the males (p. 326) and that birds seldom succeed in catching dragonflies (p. 330) are not in accord with records from other sources. His method of "bristling" specimens, which does not include the head and prothorax (p. 355), is surely faulty, as everyone who has worked with the older collections, including that of de Selys himself, can

* Reference is doubtless made to figure 4, page 574 of volume xlii, *The American Naturalist*, Sept., 1908.

testify. Nor can the keeping of insects in large tobacco boxes (p. 356) be endorsed, unless the Australian boxes are very much tighter than those of this part of the world, even if our practice does not always agree with our preaching! The presence of decaying vegetable matter is surely *not* essential in rearing the eggs of all Odonata (p. 358); in the annual case of *Sympetrum vicinum* mentioned above, no vegetable matter is employed.

The title of No. 22 in the bibliography (p. 364) is incorrectly given; the paper in question had not the wide scope which the misquotation implies. The larger German text-books are so extensive that the student will have some difficulty in finding the Odonata on "pp. 380 *et seq.*" of No. 81 in the same list (p. 367); "Allgemeiner Theil, 4te Lieferung, 1910," at least should be added to the citation. Some mention should be made in the bibliography, even with its limitations as laid down in the preface (pp. vii-viii), of the work of A. N. Bartenef on the Palaearctic fauna. In view of the use of the word *cell* in two distinct meanings on the same page (*e. g.* 244), it would seem desirable to include both meanings in the glossary (p. 377), as those who need the one would also require the other. On page 378 is the remark that the word *exuviae* does not exist in the singular and, although the Century Dictionary (not to quote others) supports this statement, yet *exuvia* and *exuvium* appear in at least one American entomological glossary and it is difficult to see why this is not as good neo-Latin terminology as many of our accepted generic and specific names.

Mr. Tillyard says in his preface (pp. ix-x): "Readers will . . . not fail to discover a very strong Australian 'flavour' in the book. Those who know how rich and varied the Australian Dragonfly-fauna is, will look upon this rather as an advantage than otherwise. While care has been exercised in selecting, for general description, well-known genera of wide distribution, yet there has been no hesitation in making use of the more archaic Australian forms, when these latter could throw new light on the phylogeny of the Order."

We welcome the Australian flavor and the ectogenic, if not entogenic, Australian authorship on this and other grounds as well. We look to younger continents, as well as to younger men, for new points of view, for liberation from the thralldom of stereotyped ideas, and Mr. Tillyard has assuredly given us these in plenty in his *Biology of Dragonflies*.—P. P. Calvert.

Abundance of Sympetrum rubicundulum (Odonata).

Sympetrum rubicundulum Say was exceedingly common in my garden as well as in those of my neighbors, at Mt. Airy, Pennsylvania, during the month of September, 1917. The nearest breeding place is at least a half mile from my home.—Philip Laurent, Philadelphia, Pa.

Doings of Societies.

The American Entomological Society.

Meeting of June 11, 1917, in the hall of the Academy of Natural Sciences of Philadelphia. Dr. Henry Skinner, President, in the chair; nine persons present. Mr. C. W. Frost was elected a member.

The donations from Mr. Harry B. Weiss of specimens of *Diorymellus laevimargo* Champ. and *Megastigmus aculeatus* Swed. and from Mr. Albert F. Swain of a collection of paratypes of Californian aphids were announced.

Orthoptera.—Mr. J. A. G. Rehn exhibited the Hebard collection of North American Blattidae, containing all the known species, and made interesting remarks on the history of the nomenclature and the distribution and habits of the species.

Odonata.—Dr. P. P. Calvert exhibited the type of *Miocora peraltica*, new genus, new species, from Costa Rica, described in Entomological News for June, 1917, and spoke briefly of its habitat and its generic differentials. He also exhibited two larval exuviæ of *Hagenius brevistylus* which he had found on stones below a dam, on the banks of Darby Creek, above Heyville, Delaware County, Pennsylvania, June 18, 1916, and a female imago which he had taken on the bank of Crum Creek near Castle Rock, Pennsylvania, June 23, 1916, and suggested that members be on the lookout for this species of which there was only one previous record of its occurrence in the vicinity of Philadelphia, that of a nymph found in Fairmount Park in 1893, by the late C. F. Seiss (Ent. News, V, p. 324).

Lepidoptera.—Dr. H. Skinner exhibited the pupal skin of *Megathymus cofaqui* from which the insect, shown at a previous meeting, emerged June 8th. It was sent from Venice, Florida.

General.—Dr. P. P. Calvert exhibited some vials of alcoholic specimens of Arthropods from Costa Rican bromeliads and commented on them briefly, also parts of bull's horn thorn (*Acacia* spp.) and the ants (*Pseudomyrma* spp.) which inhabit this plant, from the same country. Referring to a course on the history of entomology which he had just been giving during the closing academic year at the University of Pennsylvania, he named the following naturalists selected for discussion in this course as having had great influence on the progress of entomology: Aristotle, Malpighi, Leeuwenhoek, Swammerdam, Redi, Reaumur, Roesel von Rosenhof, Ray, Linnaeus, Fabricius, Latreille, Cuvier, Lamarck, Savigny, Darwin, Wallace, Haeckel, Weismann and Lubbock; the time limits of the course prevented the inclusion of others.—R. C. Williams, Jr., *Recording Secretary.*

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